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SUPPLEMENTARY MATERIAL

Social calls characterisation of the island-restricted Madeiran Pipistrelle (*Pipistrellus maderensis*)

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Table 1 - Capture data from recorded individuals of *P. maderensis*

Ext Code	Date	Location	Time	Species	weight (bag + bat)	weight (bag)	Weight neto (g)	Sex	Age	FA	Repro. Status
DMM70	05.08.2021	Curral das freiras	00:00	*Pipistrellus maderensis*	15.07	11.31	3.76	M	J	31.4	NR
DMM71	05.08.2021	Curral das freiras	00:10	*Pipistrellus maderensis*	15.79	11.43	4.36	F	J	33.75	NR
DMM46	22.08.2021	Ecological Park of Funchal	00:43	*Pipistrellus maderensis*	14.88	10.57	4.31	F	A	30.28	NR

Table 2 - Definitions and terms used for social call parameters

Term	Description
Component	A distinct, single unit of sound within a call or sequence
Pulse	A distinct, single unit of sound within a call, similar to a component but typically referring to a more complex sound structure (e.g. including multiple elements but is still considered a single unit)
Syllable	Each different aspect in terms of structure, within a single component (e.g. often used synonym with harmonic)
Sequence	A group of components or pulses closely associated to each other and separated in time from others (e.g. Numbers in bold in Table A.5. indicate the start and end in time (s) of an entire sequence comprising of several components)
FM	Frequency modulated
CF	Constant frequency
QCF	Quasi constant frequency
Narrowband	Calls within a short frequency range
Broadband	Calls within a wide frequency range
Multi-harmonic	Frequency that is an integer multiple of fundamental frequencies
Fstart (kHz)	Start for particular analysis window in frequency (in kHz)
Fend (kHz)	End for particular analysis window in frequency (in kHz)
Call dur (s)	Length (duration) of individual component or pulse within the sequence (in seconds)
Fmin (kHz)	Minimum frequency of fundamental component or pulse (in kHz)
Fmax (kHz)	Maximum frequency of fundamental component or pulse (in kHz) (e.g., maximum frequency of last harmonic)
Fmean (kHz)	Mean Frequency calculated as (2 × Fpeak (kHz) + Fmin (kHz) + Fmax (kHz)) / 4
Fpeak (kHz)	Frequency at which the component or pulse has the highest intensity of energy (in kHz)
Inter-pulse interval (s)	Time interval between successive components or pulses (in seconds) (e.g., from the end of one component to the start of the next component or echolocation call)
Call shape	Frequency modulation change over time of components
Call structure	Organization and arrangement of various elements (e.g. repetition of components or number of syllables)

Table 3 - PCA scores and variance explained for the first three principal components (PC1, PC2, PC3) for each social call type.

Social Call Type	PC1 Score	PC2 Score	PC3 Score	Variance Explained (%)
A	0,1581	1,8470	-1,7746	30,87
B	-0,5404	-1,5080	1,4658	64,76
C.c	-15,2764	0,0593	-0,9856	62,99
C.i	-0,9552	-0,3428	0,1186	30,71
D	0,4965	0,2986	0,4388	38,10

Table 4 - Loadings of acoustic features on the first three principal components.

Feature	PC1	PC2	PC3
Call Duration (ms)	-0,011	-0,721	-0,521
Minimum Frequency (kHz)	0,438	0,336	0,221
Maximum Frequency (kHz)	-0,491	-0,113	-0,177
Mean Frequency (kHz)	-0,537	0,008	-0,101
Peak Frequency (kHz)	-0,508	-0,002	-0,128
Inter-Pulse Interval (ms)	-0,146	-0,595	0,789

Table 5 - Comprehensive overview of analysed files and social call sequences of *P. maderensis* including all measured parameters

File and Input directory					Analysis Window (Seq. Start and End bold)				Analysis Parameter								
FOLDER	FILE NAME	DURATION (s)	DATE	TIME	Tstart (s)	Tend (s)	Fstart (kHz)	Fend (kHz)	Call dur (ms)	Fmin (kHz)	Fmax (kHz)	Fmean (kHz)	Fpeak (kHz)	Inter-pulse interval (ms)	Call shape	Call structure and components	SC Type
05.08.21	EM_20210806_013243.wav	4,8420	2021-08-06	01:32:43	**0,1491**	**0,1908**	5,2660	72,1470	~ 1,74	16,0	67,2	29,9	18,2	~ 6,90	steep broadband FM	5 repetativ components	B
					0,2432	**0,3296**	7,6800	99,2000	~ 3,8	17,5	70,0	39,3	34,9	~ 11,70	steep broadband FM	3 repetativ components	B
					0,3684	3,8473	12,0000	83,1800	35,00	24,1	68,6	48,6	51,0	19,20	descanding FM	2 repetativ components / 2 syllables	C.i.
					0,3918	**0,4036**	12,0000	72,0840	35,60	21,7	69,2	48,3	51,1	83,00			
					0,4796	**0,5602**	4,9050	71,3180	77,00	7,5	70,8	29,6	20,0	144,00	long trill QCF, FM arched at end	multi harmonic	A
					0,6699	**0,7633**	3,7570	108,3160	~ 6,66	18,2	72,0	40,0	34,9	~ 11,10	steep broadband FM	3 repetativ components	B
					1,3835	**1,4939**	1,1690	106,9950	97,60	6,9	79,2	34,9	26,7	113,00	long trill QCF, FM arched at end	multi harmonic	A
					1,3885	**1,4779**	3,6500	119,1500	81,88	7,3	80,2	38,4	33,0	117,50	long trill QCF, FM arched at end	multi harmonic	A
					1,6075	**1,6514**	0,6000	116,0000	39,40	6,9	70,3	31,2	23,9	351,20	long trill QCF, FM arched at end	multi harmonic	A
05.08.21	EM_20210806_013254.wav	4,3660	2021-08-06	01:32:54	**0,0585**	**0,1463**	1,9200	110,0000	~ 1,7	15,1	73,0	32,5	20,9	~ 7,80	steep broadband FM	5 repetativ components	B
					0,2385	**0,2444**	8,8040	123,9300	4,00	26,4	98,8	51,2	39,8	93,01	descanding FM	2 syllables	C.i.
					0,3648	**0,3768**	12,7660	116,7180	3,70	28,6	97,3	52,9	42,9	97,52	descanding FM	2 syllables	C.i.
					0,4903	0,4993	4,2550	115,5020	2,60	21,2	89,2	42,5	29,9	17,70	descanding FM	2 repetativ components / 2 syllables	C.i.
					0,5116	**0,5226**	6,6500	110,6390	2,70	20,7	88,8	41,8	28,8	108,80			
					0,6250	**0,6848**	6,6380	118,8180	~ 3,29	16,6	67,0	31,5	21,2	~ 22,30	steep broadband FM	3 repetativ components	C.c.
					0,7506	**0,8043**	2,6550	111,5160	1,90	12,6	68,4	30,3	20,0	~ 7,90	steep broadband FM	5 repetativ components	B
					0,8778	**0,9457**	1,3280	115,4990	63,60	6,0	56,2	25,1	19,1	82,20	long trill QCF, FM arched at end	multi harmonic	A
22.08.21	EM_20210823_005131.wav	7,0850	2021-08-23	00:51:31	**1,7965**	**2,2353**	6,9920	65,5040	~ 3,41	14,0	24,6	18,1	17,0	~ 7,16	steep broadband FM	6 repetativ components	B
22.08.21	EM_20210823_005152.wav	6,6930	2021-08-23	00:51:52	**3,4483**	**3,8153**	4,1340	42,4320	~ 2,87	12,8	23,2	16,6	15,2	~ 7,76	steep broadband FM	5 repetativ components	B
22.08.21	EM_20210822_220638.wav	7,2690	2021-08-22	22:06:38	**2,9410**	**3,2070**	7,2000	45,8000	~ 2,46	12,7	22,8	15,3	13,0	~ 7,51	steep broadband FM	4 repetativ components	B
					4,4878	**4,7439**	6,9440	48,6080	~ 2,76	12,5	25,2	16,5	14,1	~ 4,96	steep broadband FM	4 repetativ components	B
22.08.21	EM_20210823_003939.wav	4,5357	2021-08-23	00:39:39	**0,0012**	**0,5020**	4,4350	83,0590	~ 6,57	15,2	33,4	21,1	17,9	~ 7,31	steep broadband FM	6 repetativ components	B
					13,8877	**13,9816**	3,6700	119,3000	~ 9,86	6,7	65,8	25,0	13,8	~ 18,8	steep broadband FM	4 repetativ components	B
22.08.21	EM_20210822_220330.wav	14,9990	2021-08-22	22:03:30	**7,2392**	7,6084	3,8400	109,4400	2,20	39,5	81,8	49,4	38,2	12,00	descending FM-CF	3 repetative components / 2 syllables	C.i.
					7,9813	7,9959	5,6080	123,3780	2,50	32,3	73,5	44,5	36,2	12,12			
					8,2891	**8,3094**	2,6580	103,6530	4,70	33,0	68,3	41,8	33,0	11,60			
22.08.21	EM_20210823_005300.wav	4,2600	2021-08-23	00:53:00	**0,4087**	**0,5792**	5,5000	44,9000	~ 6,62	14,0	30,9	20,2	18,0	~ 6,30	steep broadband FM	3 repetativ components	B
05.08.21	EM_20210806_001022.wav	12,2810	2021-08-06	00:10:22	**0,1989**	**0,2253**	23,0400	115,2000	13,60	27,1	103,6	57,7	50,1	NA	Descending FM-CF	3 syllable	C.i
					0,6681	0,7112	20,0100	116,0000	8,80	26,1	103,4	55,8	46,9	73,00	Descending FM-CF	3 syllable per component / 6 repetative components	C.c.
					0,7660	0,8014	17,0680	115,6460	4,10	27,1	102,4	54,8	44,8	86,00			
					0,8741	0,9391	11,0630	124,7710	19,32	25,1	100,1	56,3	50,0	42,00			
					0,9381	0,9982	17,6560	120,0630	16,30	26,4	98,9	52,8	43,0	91,20			
					1,0590	1,0937	14,7150	115,2120	13,80	26,5	103,0	55,4	46,1	46,70			
					1,1209	**1,1530**	11,1820	123,0060	17,80	26,6	96,5	57,8	54,0	10,90			
					2,0360	2,0892	18,5810	118,4000	14,80	29,3	94,7	54,0	46,0		Descending FM-CF	3 syllable / 2repetativ components	C.i
					2,1359	**2,1737**	16,6400	115,6400	9,30	30,2	96,6	63,7	63,9	70,70			
					2,4247	**2,4605**	12,6800	120,9200	15,00	24,7	94,8	56,4	53,1	NA	Descending FM-CF	3 syllable	C.i
					4,5657	**4,6169**	16,0000	116,4800	17,90	25,0	94,1	56,3	53,0	NA	Descending FM-CF	3 syllable	C.i
05.08.21	EM_20210806_001036.wav	14,9990	2021-08-06	00:10:36	**10,1539**	10,2229	16,0000	112,0000	17,00	26,3	90,2	55,1	52,0	39,40	Descending FM-CF	3 syllable / 3 repetativ components	C.c.
					10,2296	10,2918	15,3600	110,8800	16,70	25,0	90,9	54,9	51,9	84,20			
					10,5637	**10,5632**	18,5600	105,6000	15,10	26,2	90,2	55,6	53,0	69,80			
					10,5866	10,6322	17,9200	112,0000	13,40	29,4	95,4	56,8	51,2	58,40	Descending FM-CF	3 syllable / 2 repetativ components	C.i.
					11,1293	**11,1660**	19,8400	102,4000	14,80	24,2	76,1	49,1	48,0				
					13,4515	**13,4904**	17,2800	105,7600	17,30	25,6	90,2	42,1	26,2	NA	Descending FM-CF	3 syllable	C.i.
					13,8819	13,9241	14,7200	110,7200	17,00	25,7	99,8	51,9	41,1	10,85	Descending FM-CF	3 syllable / 2 repetativ components	C.i.
					13,9820	**14,0231**	19,8400	108,1600	23,00	23,0	101,8	52,8	43,1	98,1			
05.08.21	EM_20210806_001108.wav	92,4300	2021-08-06	00:11:08	**1,7157**	**1,7387**	21,5600	106,5690	12,10	25,7	99,3	55,2	47,9		Descending FM-CF	3 syllable	C.i
05.08.21	EM_20210805_232307.wav	14,9990	2021-08-05	23:23:07	**5,2111**	5,2456	23,6160	74,8800	6,50	31,0	66,8	47,6	46,3		Descending FM-CF	2 syllables	C.i.
					5,2798	**5,2980**	24,7680	74,5920	10,80	28,5	67,2	45,9	43,9	44,40		3 syllable	
05.08.21	EM_20210805_231726.wav	12,1710	2021-08-05	23:17:26	**6,4764**	**6,4951**	28,4230	64,4110	8,80	31,4	54,4	39,0	35,0	NA	Descending FM-CF	2 syllables	C.i.
05.08.21	EM_20210806_001006.wav	14,9990	2021-08-06	00:10:06	**6,6125**	**6,6920**	16,8430	101,7290	20,20	23,3	73,2	36,7	25,2	NA	Descending FM-CF	2 syllables	C.i.
					7,0259	**7,0782**	17,9200	118,4000	20,70	27,5	73,7	50,3	49,9	NA	Descending FM-CF	3 syllables	C.i.
					7,3054	**7,3493**	17,9200	112,0000	24,40	27,5	65,7	47,3	48,0	NA	Descending FM-CF	2 syllables	C.i.
					8,4254	8,4771	20,9450	114,6180	21,40	29,0	82,0	51,3	47,0		Descending FM-CF	3 syllables / 2 repetativ components	C.i.
					8,5095	**8,5755**	19,7820	11,7090	25,00	26,8	81,3	50,0	46,1	72,68			
					9,0262	0,0702	21,5510	102,3680	10,50	29,3	70,0	47,9	46,0		Descending FM-CF	2 syllables	C.i.
					9,1099	**9,1429**	24,5440	102,9670	14,40	29,7	69,4	48,1	46,7	68,30			
					9,3193	9,3567	22,7880	103,4590	18,10	26,9	72,0	48,2	47,0	71,90	Descending FM-CF	3 syllables / 3 repatativ components	C.c.
					9,4140	9,4619	20,5100	99,8130	17,40	26,4	72,0	48,7	48,1	83,50			
					9,3182	**9,3602**	21,8770	103,4590	17,10	26,9	71,1	47,5	46,0	88,90			
					10,5652	10,6077	26,1850	109,7530	27,30	29,7	94,7	54,1	46,0	59,50	Descending FM-CF	3 syllables / 2 repatativ components	C.c.
					10,6474	10,6889	17,2710	106,4100	27,60	25,1	99,7	57,7	52,9	14,20			
					10,6870	**10,7201**	30,3130	103,6240	24,20	40,0	95,3	57,3	47,0	63,70		2 syllables	
					10,9004	10,9514	17,2710	105,8530	17,00	26,2	99,2	49,9	37,1	56,70		3 syllables	
					10,9854	11,0289	16,7140	107,5240	28,30	26,3	99,7	44,6	26,3	10,40			
					11,0260	11,0534	35,6560	103,6240	11,30	40,6	99,6	58,6	47,1	44,40		2 syllables	
					11,0931	11,1328	23,9560	109,1960	15,10	31,2	99,7	56,7	47,9	53,80			
					11,1689	11,1980	21,7180	110,3100	14,50	26,8	99,7	55,7	48,2	21,80		3 syllables	
					11,2043	11,2285	36,2130	111,9810	7,20	41,8	95,9	58,9	48,9	58,90		2 syllables	
					11,2707	11,2906	20,6130	103,6240	19,70	26,2	98,5	53,7	45,0	12,10		3 syllables	
					11,3040	11,3184	27,8560	93,0390	9,50	34,5	84,7	52,8	45,9	50,60		2 syllables	
					11,3643	11,3876	21,7280	112,5380	18,50	26,2	87,5	50,9	45,0	12,00		3 syllables	
					11,3949	11,4096	30,6420	91,3680	8,20	39,0	80,0	50,3	41,1	51,50		2 syllables	
					11,4568	11,4808	17,2710	108,6390	20,20	27,1	78,4	45,9	39,0	12,60		3 syllables	
					11,4887	11,5034	33,9840	95,2680	8,10	39,6	80,2	51,0	42,2	40,20		2 syllables	
					11,5606	11,5759	30,0850	115,8800	8,50	38,4	85,7	53,5	45,0	45,70		2 syllables	
					11,6336	11,6729	18,3850	106,9670	35,70	24,0	95,9	51,4	42,8	33,90		3 syllables	
					11,7220	11,7534	19,4990	106,9670	24,00	24,5	101,9	53,6	44,0	12,90		3 syllables	
					11,7618	11,7699	33,9840	91,3680	8,10	38,4	84,7	53,9	46,2	63,90		2 syllables	
					11,8321	11,8617	18,3850	110,3100	24,20	25,1	104,8	54,9	45,0	12,90		3 syllables	
					11,8696	11,8816	31,7560	98,6100	8,60	36,7	83,6	52,1	44,0	63,60		2 syllables	
					12,0242	12,0608	14,4850	114,7670	28,60	25,0	97,4	56,2	51,2	51,10		3 syllables	
					12,1189	12,1452	19,4990	109,1960	20,80	26,6	97,5	56,5	51,0	61,50		3 syllables	
					12,2010	12,2293	20,6130	113,0960	23,10	27,1	95,8	56,2	50,9	12,90		3 syllables	
					12,2385	12,2511	30,0850	107,5240	9,70	39,0	103,6	58,7	46,0	54,20		2 syllables	
					12,3018	12,3299	20,0560	106,9670	24,50	26,6	94,7	52,8	45,0	14,50		3 syllables	
					12,3398	12,3522	30,0850	109,7530	12,30	37,9	94,8	55,7	45,0	65,30		2 syllables	
					12,4121	12,4354	18,9420	112,5380	15,00	28,6	94,7	61,4	61,2	80,90		3 syllables	
					12,5082	12,5225	27,3270	11,3010	5,70	44,0	98,3	61,1	51,0	94,90		2 syllables	
					12,6832	12,7076	20,0560	110,3000	19,50	27,4	97,5	60,9	59,3	92,50		3 syllables	
					13,4952	13,5203	21,1710	113,0960	12,10	27,4	98,1	53,8	44,9	77,90		3 syllables	
					13,5931	13,6193	20,6130	114,7670	22,10	26,9	93,0	56,0	52,0	84,20		3 syllables	
					13,6985	13,7276	16,7140	111,9810	23,00	24,8	95,8	55,6	50,8	73,90		3 syllables	
					13,7966	13,8264	17,8280	108,6390	22,60	24,5	94,2	55,6	51,9	19,20		3 syllables	
					13,8380	13,8517	34,5410	93,0390	7,60	39,3	88,0	52,9	42,1	164,10		2 syllables	
					14,0107	14,0172	24,5130	114,2100	11,30	31,9	100,3	58,0	49,9	82,99		2 syllables	
					14,1054	14,1280	24,5130	110,8670	17,50	30,5	97,5	57,0	49,9	162,10		2 syllables	
					14,3419	14,3419	19,1150	111,7950	18,20	24,9	105,4	58,6	52,0	12,30		3 syllables	
					14,3468	14,3647	30,7000	103,1070	11,70	34,1	96,7	53,2	40,9	65,50		2 syllables	
					14,4166	**14,4345**	30,7000	112,9540	10,50	35,9	88,6	55,1	47,9	11,10		2 syllables	
05.08.21	EM_20210805_231816.wav	14,9990	2021-08-05	23:18:16	**14,2609**	**14,2975**	10,6740	26,7250	~ 7,40	13,9	23,0	16,7	15,0	~ 4,62	Shallow narrowband FM (V shaped)	5 repetativ components	D
05.08.21	EM_20210805_231554.wav	14,9990	2021-08-05	23:15:54	**5,5556**	**5,6007**	12,9250	44,3570	~ 8,85	14,4	31,0	19,8	16,9	~ 11,32	Shallow narrowband FM (V shaped)	4 repetativ components	D
					6,7584	**6,8178**	11,4290	42,3810	~ 6,78	12,9	35,7	20,1	15,9	~ 10,42	Shallow narrowband FM (V shaped)	5 repetativ components	D
05.08.21	EM_20210805_231627.wav	14,9990	2021-08-05	23:16:27	**6,0658**	**6,0982**	11,3270	37,0720	~ 6,08	13,0	30,0	18,7	15,9	~ 8,91	Shallow narrowband FM (V shaped)	4 repetativ components	D
05.08.21	EM_20210805_232703.wav	14,9990	2021-08-05	23:27:03	**3,2021**	**3,2456**	10,8560	32,2070	~ 7,13	12,9	28,0	18,2	15,9	~ 11,71	Shallow narrowband FM (V shaped)	4 repetativ components	D