Supplementary materials

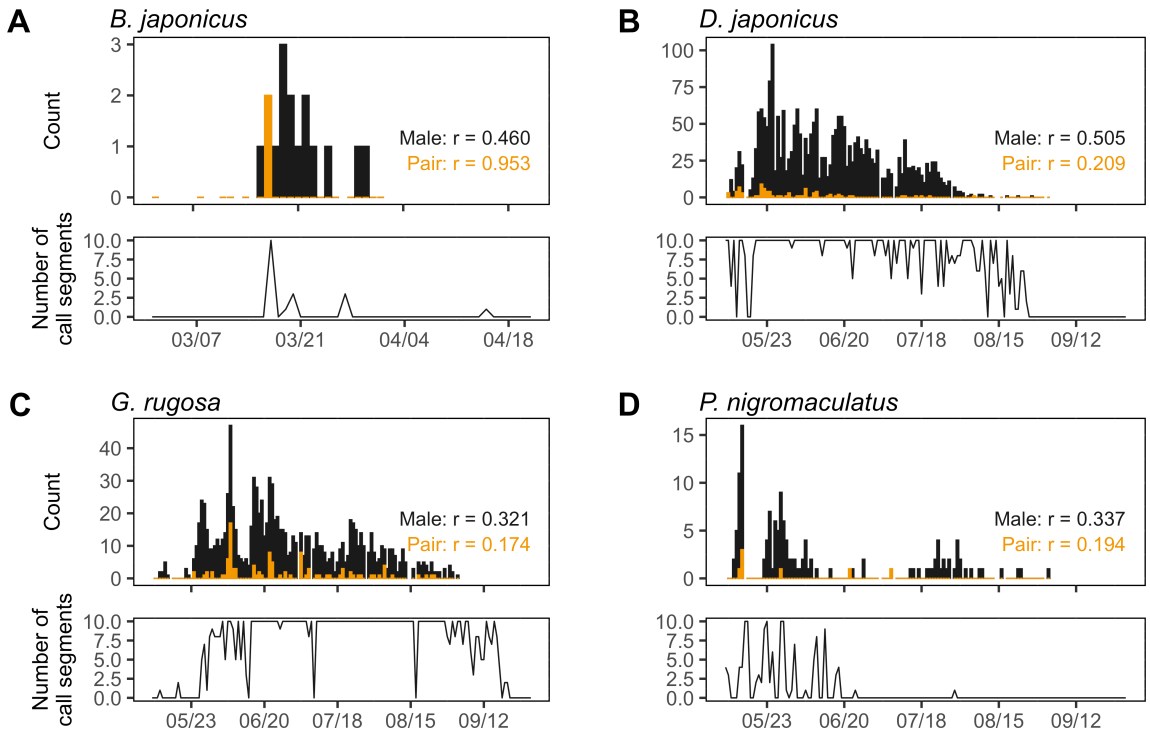

Figure S1. Relationships between the number of males or pairs and calling activity, quantified by the number of call segments at a single time point close to our survey (13:00 for *B. japonicus* and 21:00 for other species). Black bars represent the number of males, and orange represent the number of pairs in amplexus. Pearson's correlation coefficients (r) between abundance and calling activity are shown. Note that correlations are, in most cases, weaker than Figure 4 in the main article, which used the daily average number of call segments.

Table S1. All compared models of generalized least squares (GLS) regression analysis testing the relationships between the number of call segments and the number of males observed.

Species	Correlation structure	Estimate	Std.Error	*t*	*p*	*df*	AIC	ΔAIC
Bufo japonicus	MA(1)	0.905	0.283	3.197	**0.005**	4	74.59	0.00
	MA(2)	0.912	0.256	3.555	**0.002**	5	76.08	-1.50
	ARMA(1,1)	0.910	0.267	3.403	**0.003**	5	76.25	-1.66
	ARMA(2,1)	0.959	0.239	4.006	**< 0.001**	6	77.64	-3.06
	ARMA(2,2)	0.888	0.222	4.005	**< 0.001**	7	78.16	-3.57
	AR(1)	0.558	0.369	1.511	0.147	4	78.22	-3.63
	AR(2)	0.630	0.307	2.049	0.055	5	78.36	-3.77
	ARMA(1,2)	0.864	0.298	2.897	**0.009**	6	78.81	-4.22
	No correlations	0.911	0.411	2.217	**0.039**	3	84.39	-9.80
Dryophytes japonicus	ARMA(2,1)	0.011	0.004	2.624	**0.010**	6	229.80	0.00
	ARMA(1,2)	0.012	0.004	2.718	**0.008**	6	231.58	-1.78
	ARMA(2,2)	0.012	0.004	2.627	**0.010**	7	231.71	-1.92
	ARMA(1,1)	0.012	0.004	2.620	**0.010**	5	232.19	-2.40
	AR(2)	0.011	0.004	2.483	**0.015**	5	233.61	-3.82
	AR(1)	0.010	0.004	2.374	**0.019**	4	237.39	-7.59
	MA(2)	0.023	0.005	4.795	**< 0.001**	5	271.48	-41.68
	MA(1)	0.029	0.005	6.330	**< 0.001**	4	290.08	-60.29
	No correlations	0.041	0.005	9.113	**< 0.001**	3	321.65	-91.86
Glandirana rugosa	ARMA(1,1)	0.071	0.011	6.397	**< 0.001**	5	249.94	0.00
	ARMA(2,1)	0.073	0.012	6.331	**< 0.001**	6	250.05	-0.10
	ARMA(1,2)	0.071	0.011	6.243	**< 0.001**	6	250.94	-0.99
	ARMA(2,2)	0.073	0.011	6.685	**< 0.001**	7	252.79	-2.84
	AR(2)	0.085	0.012	7.379	**< 0.001**	5	253.79	-3.84
	AR(1)	0.078	0.014	5.672	**< 0.001**	4	268.84	-18.90
	MA(2)	0.085	0.013	6.317	**< 0.001**	5	289.87	-39.92
	MA(1)	0.068	0.014	4.716	**< 0.001**	4	317.65	-67.71

	No correlations	0.074	0.013	5.519	**< 0.001**	3	354.92	-104.97
Pelophylax nigromaculatus	AR(2)	0.130	0.025	5.133	**< 0.001**	5	179.07	0.00
	ARMA(1,2)	0.135	0.024	5.540	**< 0.001**	6	179.88	-0.81
	ARMA(1,1)	0.122	0.026	4.718	**< 0.001**	5	180.40	-1.34
	ARMA(2,2)	0.137	0.023	5.853	**< 0.001**	7	180.93	-1.87
	ARMA(2,1)	0.130	0.025	5.149	**< 0.001**	6	181.06	-1.99
	AR(1)	0.082	0.028	2.946	**0.004**	4	184.31	-5.24
	MA(2)	0.143	0.032	4.447	**< 0.001**	5	215.21	-36.14
	MA(1)	0.171	0.033	5.228	**< 0.001**	4	239.09	-60.02
	No correlations	0.266	0.032	8.370	**< 0.001**	3	273.01	-93.94

Table S2. All compared models of generalized least squares (GLS) regression analysis testing the relationships between the number of call segments and the number of amplexing pairs observed.

Species	Correlation structure	Estimate	Std.Error	*t*	*p*	*df*	AIC	ΔAIC
Bufo japonicus	ARMA(1,1)	1.567	0.136	11.493	**< 0.001**	5	53.90	0.00
	AR(2)	1.622	0.178	9.110	**< 0.001**	5	54.52	-0.62
	ARMA(2,1)	1.514	0.130	11.620	**< 0.001**	6	55.03	-1.13
	MA(2)	1.463	0.152	9.654	**< 0.001**	5	55.34	-1.44
	ARMA(1,2)	1.603	0.134	11.922	**< 0.001**	6	55.51	-1.60
	ARMA(2,2)	1.557	0.126	12.388	**< 0.001**	7	56.70	-2.80
	AR(1)	1.962	0.299	6.557	**< 0.001**	4	57.75	-3.85
	MA(1)	1.740	0.284	6.123	**< 0.001**	4	61.40	-7.50
	No correlations	3.352	0.540	6.213	**< 0.001**	3	66.27	-12.36
Dryophytes japonicus	ARMA(2,1)	0.077	0.043	1.786	**0.077**	6	228.95	0.00
	ARMA(1,1)	0.097	0.042	2.329	**0.022**	5	229.59	-0.65
	ARMA(1,2)	0.090	0.043	2.101	**0.038**	6	230.02	-1.08
	AR(2)	0.078	0.041	1.918	**0.058**	5	231.64	-2.70
	ARMA(2,2)	0.090	0.040	2.268	**0.025**	7	232.18	-3.23
	AR(1)	0.045	0.042	1.065	**0.289**	4	236.93	-7.99
	MA(2)	0.061	0.046	1.313	**0.192**	5	282.95	-54.01
	MA(1)	0.096	0.061	1.587	**0.115**	4	309.29	-80.34
	No correlations	0.250	0.075	3.350	**0.001**	3	367.45	-138.50
Glandirana rugosa	ARMA(1,1)	0.180	0.031	5.840	**< 0.001**	5	253.22	0.00
	ARMA(2,1)	0.175	0.031	5.596	**< 0.001**	6	254.60	-1.39
	ARMA(1,2)	0.175	0.031	5.610	**< 0.001**	6	254.70	-1.49
	ARMA(2,2)	0.181	0.031	5.885	**< 0.001**	7	257.13	-3.92
	AR(2)	0.194	0.031	6.346	**< 0.001**	5	260.36	-7.14
	AR(1)	0.170	0.032	5.268	**< 0.001**	4	270.81	-17.60
	MA(2)	0.181	0.036	5.054	**< 0.001**	5	296.75	-43.53
	MA(1)	0.162	0.045	3.621	**< 0.001**	4	322.17	-68.95
	No correlations	0.213	0.054	3.950	**< 0.001**	3	364.50	-111.28
Pelophylax nigromaculatus	AR(2)	0.457	0.141	3.244	**0.002**	5	184.29	0.00

ARMA(2,2)	0.643	0.121	5.322	**< 0.001**	7	184.74	-0.46
ARMA(1,1)	0.418	0.143	2.919	**0.004**	5	184.89	-0.60
ARMA(1,2)	0.510	0.135	3.783	**< 0.001**	6	185.16	-0.87
AR(1)	0.285	0.146	1.958	**0.053**	4	185.29	-1.00
ARMA(2,1)	0.455	0.140	3.238	**0.002**	6	186.23	-1.94
MA(2)	0.228	0.167	1.367	**0.174**	5	222.12	-37.83
MA(1)	0.159	0.211	0.753	**0.453**	4	249.54	-65.26
No correlations	1.068	0.268	3.989	**< 0.001**	3	308.27	-123.98