

Table S1. Results of the scientific literature survey of selected studies that used the INGEZIM West Nile COMPAC blocking ELISA (bELISA; Ingenasa, Spain) and performed viral neutralization tests (VNT) against different *Flavivirus* spp. (at least WNV and USUV). The target animal group, the spatial range of surveyed animals and the country where the animals came from are together shown with the number of bELISA analysed samples to show the extent of the study. Studies performed in wild birds are marked in bold letter type.

Target animal group	Spatial range	Country	No. bELISA tested	No. VNT-confirmed <i>Flavivirus</i> spp.	No. VNT-confirmed WNV	No. VNT-confirmed other <i>Flavivirus</i> spp.	WNV to other <i>Flavivirus</i> spp. predominance ratio	Reference
Feral pigeons	Córdoba city	Spain	142	6	3	3 ^a	50%	[42]
Wild birds	Country	Poland	474	63	63	0	100%	[43]
Wild birds	South-western Spain	Spain	149	2	1	1	50%	[44]
Wild ruminants	Country	Spain	4693	109	103	6 ^b	94.5%	[45]
Wild raptors	Andalusia	Spain	123	4	4	0	100%	[46]
Domestic dogs	South-western & west-central Spain	Spain	815	25	11	14 ^c	44%	[47]
<i>Passer domesticus</i>	South-western Spain	Spain	2544	18	17	1 ^a	94.4%	[48]
Zoo mammals	Country	Spain	570	16	10	6 ^d	62.5%	[49]
Horses	West-central Spain	Spain	725	154	143	11 ^a	92.9%	[5]
Wild birds	West-central Spain	Spain	384	74	70	4 ^a	94.6%	[36]
Wild birds	Badajoz city vicinity	Spain	645	21	20	1 ^a	95.2%	[37]

^aVNT-confirmed as USUV antibodies; ^bVNT-confirmed as USUV (n=4) and Meaban virus (n=1) antibodies; ^cVNT-confirmed as tick-borne encephalitis virus (TBEV) antibodies; ^dVNT-confirmed as USUV (n=5) and TBEV (n=1) antibodies.

Table S2. Total number of captured mosquitoes by genus, study site and interaction gradient in the five study sites. Specific capture data for the two predominant mosquito species, *Culex pipiens* and *Cx. theileri* is shown.

Site	Area	<i>Culex pipiens</i>	<i>Culex theileri</i>	<i>Culex</i> spp.	Cs.* spp.	An.* spp.	Ae.* spp.	Undt.*	Others	TOTAL
S ₁	A ₁	33	17	51	0	0	1	1	0	53
	A ₂	117	63	180	1	3	4	12	0	200
	A ₃	2	3	5	0	0	0	2	0	7
	Subtotal S ₁	152	83	236	1	3	5	15	0	260
S ₂	A ₁	19	61	80	0	14	0	3	0	97
	A ₂	23	29	52	1	7	2	2	0	64
	A ₃	36	41	77	3	3	3	10	0	96
	Subtotal S ₂	78	131	209	4	24	5	15	0	257
S ₃	A ₁	77	35	112	3	1	12	3	0	131
	A ₂	34	5	39	1	0	1	1	0	42
	A ₃	22	3	26	0	1	6	5	0	38
	Subtotal S ₃	133	43	177	4	2	19	9	0	211
S ₄	A ₁	1	17	18	1	0	8	3	0	30
	A ₂	14	0	14	0	0	2	2	0	18
	A ₃	28	15	43	2	3	21	2	0	71
	Subtotal S ₄	43	32	75	3	3	31	7	0	119
S ₅	A ₁	70	66	138	7	3	16	7	0	171
	A ₂	171	30	202	3	6	21	11	0	243
	A ₃	212	100	312	8	5	23	19	1	368
	Subtotal S ₅	453	196	652	18	14	60	37	1	782
All	A ₁	200	196	399	11	18	37	17	0	482
	A ₂	359	127	487	6	16	30	28	0	567
	A ₃	300	162	463	13	12	53	38	1	580
Total		859	485	1349	30	46	120	83	1	1629

*Cs.: *Culiseta* spp.; An.: *Anopheles* spp.; Ae.: *Aedes* spp.; Undt.: Undetermined genus.

Table S3. Number of birds caught per site (S₁-S₅), area (A₁-A₃) and family and results of blocking ELISA (serum) and rRT-PCR (feather cannon pulp, oral or cloacal swab).

Site	Area	Bird family	No. captures	bELISA No. tested /No. positive	rRT-PCR No. tested /No. positive	bELISA No. tested /No. positive (Prevalence)	rRT-PCR No. tested /No. positive (Prevalence)
S ₁	A ₁	<i>Corvidae</i>	10	10/1	10/0		
		<i>Emberizidae</i>	1	1/0	1/0		
		<i>Fringilidae</i>	3	3/0	1/0		
		<i>Fringillidae</i>	4	3/0	3/0		
		<i>Hirundidae</i>	1	1/0	1/0		
		<i>Paridae</i>	5	5/3	5/0	34/4	33/0
		<i>Passeridae</i>	7	7/0	6/0	(12.9%)	(0%)
		<i>Phylloscopidae</i>	1	0/0	1/0		
		<i>Sittidae</i>	1	1/0	1/0		
		<i>Sylviidae</i>	1	1/0	1/0		
		<i>Turdidae</i>	1	1/0	1/0		
		<i>Upupidae</i>	1	1/0	1/0		
	A ₂	<i>Acrocephalidae</i>	2	0/0	2/0		
		<i>Cettidae</i>	3	0/0	3/0		
		<i>Cisticolidae</i>	1	0/0	1/0		
		<i>Emberizidae</i>	3	0/0	3/0		
		<i>Fringilidae</i>	1	1/0	1/0		
		<i>Hirundidae</i>	2	0/0	2/0	7/0	28/0
		<i>Laniidae</i>	3	3/0	3/0	(0%)	(0%)
		<i>Paridae</i>	3	1/0	3/0		
		<i>Passeridae</i>	1	1/0	1/0		
		<i>Sturnidae</i>	1	1/0	1/0		
		<i>Sylviidae</i>	8	0/0	8/0		
	A ₃	<i>Acrocephalidae</i>	1	0/0	1/0		
		<i>Aegithalidae</i>	3	0/0	3/0		
		<i>Corvidae</i>	5	5/0	5/0		
		<i>Motacillidae</i>	1	1/0	1/0		
		<i>Muscicapidae</i>	1	1/0	1/0		
		<i>Paridae</i>	14	6/1	14/0	20/2	33/0
		<i>Phylloscopidae</i>	1	1/0	1/0	(10%)	(0%)
		<i>Sittidae</i>	1	1/0	1/0		
		<i>Sturnidae</i>	1	1/0	1/0		
		<i>Sylviidae</i>	3	1/0	3/0		
		<i>Turdidae</i>	3	3/1	2/0		
S ₂	A ₁	<i>Fringillidae</i>	4	3/1	4/0		
		<i>Hirundidae</i>	8	8/0	6/0		
		<i>Laniidae</i>	4	4/0	4/0		
		<i>Paridae</i>	9	4/0	8/0	48/2	43/0
		<i>Passeridae</i>	19	18/0	14/0	(4.2%)	(0%)
		<i>Sturnidae</i>	2	2/0	2/0		
		<i>Sylviidae</i>	4	3/0	2/0		
		<i>Turdidae</i>	6	6/1	3/0		
	A ₂	<i>Aegithalidae</i>	5	1/0	5/0	44/2	58/1
		<i>Corvidae</i>	5	5/0	5/0	(4.5%)	(1.7%)

S ₃	A ₃	<i>Emberizidae</i>	1	1/0	1/0		
		<i>Paridae</i>	28	15/1	25/0		
		<i>Phylloscopidae</i>	3	2/0	1/0		
		<i>Sturnidae</i>	1	1/0	1/0		
		<i>Sylviidae</i>	7	3/0	7/0		
		<i>Turdidae</i>	17	16/1	13/1		
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	A ₃	<i>Corvidae</i>	6	6/0	5/0		
		<i>Emberizidae</i>	2	2/0	2/0		
		<i>Hirundinidae</i>	1	1/0	0/0		
		<i>Laniidae</i>	2	1/0	2/0	27/0 (0%)	34/0 (0%)
		<i>Paridae</i>	22	14/0	22/0		
		<i>Sylviidae</i>	3	1/0	2/0		
		<i>Turdidae</i>	2	2/0	1/0		
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	A ₁	<i>Emberizidae</i>	2	2/0	2/0		
		<i>Fringillidae</i>	6	3/2	4/0		
		<i>Muscicapidae</i>	1	1/0	1/0		
		<i>Oriolidae</i>	1	1/0	1/0	18/3 (16.7%)	37/1 (2.7%)
		<i>Paridae</i>	7	4/0	7/0		
		<i>Phylloscopidae</i>	1	1/0	1/0		
		<i>Sylviidae</i>	2	2/0	2/0		
		<i>Turdidae</i>	4	4/1	4/1		
		<hr/>					
	A ₂	<i>Aegithalidae</i>	2	1/0	2/0		
		<i>Corvidae</i>	1	1/0	1/0		
		<i>Emberizidae</i>	12	7/1	10/1		
		<i>Fringillidae</i>	5	5/0	3/0		
		<i>Muscicapidae</i>	3	2/0	3/0	32/1 (3.1%)	37/1 (2.7%)
		<i>Paridae</i>	14	10/0	10/0		
		<i>Passeridae</i>	3	3/0	3/0		
		<i>Sittidae</i>	1	0/0	1/0		
		<i>Sylviidae</i>	2	1/0	2/0		
		<i>Turdidae</i>	2	2/0	2/0		
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	A ₃	<i>Aegithalidae</i>	4	2/0	3/0		
		<i>Cettidae</i>	1	1/0	1/0		
		<i>Emberizidae</i>	1	0/0	0/0		
		<i>Fringillidae</i>	4	3/0	4/0		
		<i>Laniidae</i>	2	2/0	1/0		
		<i>Muscicapidae</i>	4	4/0	2/0	32/0 (0%)	32/0 (0%)
		<i>Paridae</i>	8	7/0	8/0		
		<i>Passeridae</i>	4	3/0	4/0		
		<i>Phylloscopidae</i>	1	1/0	1/0		
		<i>Prunellidae</i>	1	1/0	1/0		
		<i>Sylviidae</i>	5	5/0	4/0		
		<i>Turdidae</i>	3	3/0	3/0		
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S ₄	A ₁	<i>Paridae</i>	5	5/1	5/0	23/3 (13%)	22/0 (0%)
		<i>Passeridae</i>	17	16/2	15/0		
		<i>Sittidae</i>	2	2/0	2/0		
	A ₂	<i>Columbidae</i>	15	15/0	14/0	25/1 (4%)	24/0 (0%)
		<i>Passeridae</i>	10	10/1	10/0		
		<i>Aegithalidae</i>	6	0/0	6/0		
	A ₃	<i>Certhiidae</i>	2	2/0	2/0		
		<i>Fringillidae</i>	5	5/0	5/0	34/1 (2.9%)	45/0 (0%)
		<i>Muscicapidae</i>	6	6/0	6/0		
		<i>Paridae</i>	26	21/1	26/0		
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S ₅	A ₁	<i>Hirundidae</i>	8	7/0	7/0	32/2 (6.3%)	32/0 (0%)
		<i>Paridae</i>	1	1/0	1/0		
		<i>Passeridae</i>	25	24/2	24/0		
	A ₂	<i>Aegithalidae</i>	1	1/0	1/0	35/4 (11.4%)	30/1 (3.3%)
		<i>Alcedinidae</i>	1	1/0	1/0		
		<i>Certhiidae</i>	3	3/0	3/0		
		<i>Cettidae</i>	1	0/0	0/0		
		<i>Corvidae</i>	1	1/0	1/0		
		<i>Fringillidae</i>	2	1/0	0/0		
		<i>Muscicapidae</i>	1	1/0	1/1		
		<i>Paridae</i>	16	15/2	15/0		
		<i>Phylloscopidae</i>	7	7/0	3/0		
		<i>Sylviidae</i>	2	2/0	2/0		
		<i>Turdidae</i>	3	3/2	3/0		
	A ₃	<i>Certhiidae</i>	1	1/0	1/0	25/5 (20%)	26/0 (0%)
		<i>Corvidae</i>	2	2/0	1/0		
		<i>Laniidae</i>	1	1/0	1/0		
		<i>Paridae</i>	18	17/5	18/0		
		<i>Sylviidae</i>	7	5/0	5/0		

Table S4. Bird abundance indices per site and wildlife-livestock interaction scenario throughout bird taxonomic Order and Family. Within each taxonomic level, the highest abundance index of the three interaction scenarios is shown in bolded type letter case.

Order	Family	S ₁			S ₂			S ₃			S ₄			S ₅			S ₁ -S ₅		
		A ₁	A ₂	A ₃	A ₁	A ₂	A ₃	A ₁	A ₂	A ₃	A ₁	A ₂	A ₃	A ₁	A ₂	A ₃	A ₁	A ₂	A ₃
Passeriformes	<i>Passeridae</i>	2.583	0.250	0.000	14.333	0.000	3.188	0.250	0.000	0.813	4.583	1.000	0.313	22.750	10.250	1.771	8.900	2.300	1.217
	<i>Hirundinidae</i>	0.917	0.500	0.250	0.354	0.125	0.417	0.000	0.000	0.000	0.417	0.083	0.000	3.396	3.458	0.229	1.017	0.833	0.179
	<i>Lanidae</i>	0.979	0.563	0.500	0.542	0.875	1.188	0.063	0.000	0.333	0.938	0.333	0.208	3.396	6.083	0.542	1.183	1.571	0.554
	<i>Alaudidae</i>	0.271	0.875	0.083	0.646	0.146	0.896	0.896	0.479	0.063	0.688	0.208	0.625	0.000	0.000	0.000	0.500	0.342	0.333
	<i>Aegithalidae</i>	0.250	0.063	0.583	0.000	0.000	0.000	0.250	0.000	0.125	0.000	0.083	0.417	0.000	3.042	0.125	0.100	0.638	0.250
	<i>Emberizidae</i>	1.167	1.042	0.667	0.313	0.000	0.896	0.938	0.875	0.000	4.250	0.229	0.813	1.667	0.000	0.000	1.667	0.429	0.475
	<i>Motacillidae</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.458	0.000	0.083	0.092	0.000	0.017
	<i>Turdidae</i>	0.167	0.125	0.271	0.000	0.958	0.000	0.292	0.125	0.604	0.000	0.000	0.229	0.083	0.625	0.063	0.108	0.367	0.233
	<i>Paridae</i>	0.938	1.375	0.729	0.146	0.188	0.083	1.188	1.021	1.188	0.542	0.313	1.417	0.146	2.583	0.625	0.592	1.096	0.808
	<i>Sturnidae</i>	1.375	1.792	0.063	1.813	3.583	0.000	3.229	0.708	0.000	0.188	0.438	1.729	83.313	137.500	2.083	17.983	28.804	0.775
	<i>Sylviidae</i>	0.063	0.125	0.125	0.063	0.292	0.083	0.000	0.292	0.083	0.000	0.063	0.146	0.000	0.458	0.729	0.025	0.246	0.233
	<i>Corvidae</i>	0.333	0.188	0.167	1.313	8.833	3.458	0.438	0.125	0.979	0.063	0.000	0.188	0.500	2.750	1.896	0.529	2.379	1.338
	<i>Cisticolidae</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.083	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.063	0.017	0.000	0.013
	<i>Fringillidae</i>	0.729	0.771	0.292	0.229	0.229	0.688	0.458	0.854	5.500	1.313	0.313	1.438	0.583	0.375	0.313	0.663	0.508	1.646
	<i>Sittidae</i>	0.000	0.000	0.063	0.000	0.000	0.000	0.167	0.375	0.438	0.125	0.083	0.083	0.000	0.000	0.000	0.058	0.092	0.117
	<i>Muscicapidae</i>	0.000	0.292	0.000	0.000	0.000	0.000	0.000	0.083	0.083	0.000	0.417	0.292	0.083	0.000	0.083	0.017	0.158	0.092
	<i>Cettidae</i>	0.208	0.146	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.083	0.042	0.029	0.017
	<i>Oriolidae</i>	0.000	0.083	0.229	0.000	0.000	0.000	0.229	0.542	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.046	0.125	0.046
	<i>Acrocephalidae</i>	0.000	0.313	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.083	0.000	0.000	0.017	0.063	0.000
	<i>Phylloscopidae</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	<i>Subtotal</i>	9.979	8.500	4.021	19.750	15.229	10.896	8.479	5.479	10.208	13.104	3.563	7.896	116.458	167.125	8.688	33.554	39.979	8.342
Columbiformes	<i>Columbidae</i>	2.083	1.146	0.979	0.125	0.750	0.646	0.750	0.083	0.375	0.208	0.125	0.500	3.021	1.417	1.104	1.238	0.704	0.721
Charadriiformes	<i>Charadriidae</i>	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.025	0.000
Cuculiformes	<i>Cuculidae</i>	0.063	0.000	0.000	0.000	0.000	0.000	0.063	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.025	0.000	0.000
Apodiformes	<i>Apodidae</i>	0.063	0.000	0.167	0.000	0.063	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.013	0.033
Bucerotiformes	<i>Upupidae</i>	0.292	0.208	0.083	0.000	0.563	0.083	0.063	0.000	0.000	0.000	0.000	0.125	0.646	0.000	0.000	0.200	0.154	0.058
Piciformes	<i>Picidae</i>	0.083	0.167	0.000	0.000	0.125	0.000	0.000	0.271	0.188	0.000	0.000	0.000	0.000	0.000	0.000	0.017	0.113	0.038
Accipitriformes	<i>Accipitridae</i>	0.000	0.313	0.000	0.000	0.083	0.000	0.000	0.000	0.063	0.000	0.000	0.000	0.063	0.000	0.083	0.013	0.079	0.029
Coraciiformes	<i>Meropidae</i>	0.000	5.250	0.313	0.000	0.000	0.000	0.000	0.000	0.000	0.375	0.604	0.000	0.146	0.083	0.125	0.104	1.188	0.088

	<i>Alcedinidae</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.375	0.000	0.000	0.275	0.000
	<i>Subtotal</i>	0.000	5.250	0.313	0.000	0.000	0.000	0.000	0.000	0.000	0.375	0.604	0.000	0.146	1.458	0.125	0.104	1.463	0.088
Suliformes	<i>Phalacrocoracidae</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.063	0.000	0.000	0.013	0.000	0.000
Pelecaniformes	<i>Ardeidae</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.167	0.000	0.000	0.000	0.000	0.000	0.033
Ciconiidformes	<i>Ciconiidae</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.063	0.000	0.000	0.146	0.000	0.000	0.042
Gruiformes	<i>Rallidae</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.333	0.000	0.000	0.067	0.000	0.000
	<i>Gruidae</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.021	0.000	0.438	2.250	0.000	0.000	0.854	0.000	0.088
	<i>Subtotal</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.021	0.000	0.438	2.583	0.000	0.000	0.921	0.000	0.088
Podicipediformes	<i>Podicipediformes</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.229	0.000	0.000	0.046	0.000	0.000
Anseriformes	<i>Anatidae</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.025	0.000	0.000
Galliformes	<i>Phasianidae</i>	0.000	0.000	0.083	0.000	0.000	0.083	0.063	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.000	0.033
TOTAL		12.563	15.708	5.646	19.875	16.813	11.708	9.542	5.833	10.833	15.708	4.292	9.188	123.208	170.000	10.146	36.179	42.529	9.504