

EMERGING AND NOVEL VIRUSES IN PASSERINE BIRDS

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SUPPLEMENTARY MATERIAL: TABLES S4a AND S4b: Usutu virus (USUV) detection records in class Aves

SUPPLEMENTARY TABLE S4a: USUV detection records recovered from class Aves, using PCR techniques or neutralization serology. USUV, or antibodies to it, has been recovered from at least 100 bird species, from 34 families and 18 orders. This list is a minimum figure, based on just 15 articles: a start. Just under half the detections (46%) are from order Passeriformes. USUV has only been detected from one study for the majority of species. It is thus striking that USUV has been detected in common blackbird in 11 of the 15 studies we used to compile this list. The column “Status” records whether the individual was captive, invasive or wild, and is left blank when the status is not clear, or with “Captive?” for exotic species, where the authors were not explicit.

Order	Family	Species	Status	Region	Reference
Accipitriformes	Accipitridae	<i>Accipiter gentilis</i>		Europe: Germany	7
		<i>Aquila nipalensis</i>		Europe: Germany	7
		<i>Buteo buteo</i>		Europe: Germany	7
		<i>Circus aeruginosus</i>	Wild	Europe: Austria	9
		<i>Gypaetus barbatus</i>	Wild	Europe: Austria	9
		<i>Neophron percnopterus</i>	Captive	Europe: Austria	3
		<i>Parabuteo unicinctus</i>		Europe: Germany	7
		<i>Pernis apivorus</i>		Europe: Germany	7
Anseriformes	Anatidae	<i>Alopochen aegyptiaca</i>		Europe: Belgium	2
		<i>Anas platyrhynchos</i>	Wild	Europe: Belgium	2
		<i>Anser anser</i>		Europe: Germany	7
		<i>Branta canadensis</i>	Wild	Europe: Belgium	2
		<i>Branta ruficollis</i>	Captive	Europe: Switzerland	3
		<i>Cygnus olor</i>	Wild	Europe: Belgium	2
		<i>Dendrocygna viduata</i>	Wild	Africa: Madagascar	6
		<i>Mergus squamatus</i>		Europe: Germany	7
		<i>Spatula hottentota</i>	Wild	Africa: Madagascar	6
		<i>Tachyeres pteneres</i>	Captive	Europe: Switzerland	3
		<i>Tadorna ferruginea</i>	Captive	Europe: Switzerland	3
Apodiformes	Apodidae	<i>Apus apus</i>	Wild	Europe: Belgium	2
Bucerotiformes	Bucerotidae	<i>Bycanistes sharpii</i>	Wild	Africa: Nigeria	11
Ciconiiformes	Ciconiidae	<i>Ciconia ciconia</i>	Captive	Europe: Austria	3
		<i>Leptoptilos crumenifer</i>	Captive	Europe: Switzerland	3
Columbiformes	Columbidae	<i>Columba livia domestica</i>		Europe: Belgium	2
		<i>Columba palumbus</i>		Europe: Germany	7
		<i>Streptopelia decaocto</i>	Wild	Europe: Austria	9
Coraciiformes	Alcedinidae	<i>Dacelo novaeguineae</i>	Captive	Europe: Switzerland	3
		<i>Alcedo atthis</i>	Wild	Europe: Germany	1

Falconiformes	Falconidae	<i>Falco tinnunculus</i>	Wild	Europe: Austria	9, 10
Galliformes	Phasianidae	<i>Gallus gallus domesticus</i>	Captive	Europe: Switzerland	3
		<i>Pavo cristatus</i>		Europe: Austria	9
		<i>Phasianus colchicus</i>		Europe: Austria	9
		<i>Tetrao urogallus</i>		Europe: Germany	7
Passeriformes	Acrocephalidae	<i>Acrocephalus scirpaceus</i>	Wild	Europe: Austria	9
	Corvidae	<i>Coccothraustes coccothraustes</i>		Europe: Germany	7
		<i>Coloeus monedula</i>	Wild	Europe: Germany	9, 10
		<i>Corvus corone</i>	Wild	Europe: Germany	10
		<i>Corvus corone cornix</i>	Wild	Europe: Austria	9
		<i>Cyanopica cooki</i>	Wild	Europe: Spain	4
		<i>Garrulus glandarius</i>	Wild	Europe: Belgium	2
		<i>Nucifraga caryocatactes</i>		Europe: Germany	7
		<i>Pica pica</i>	Wild	Europe: Belgium	2
		<i>Pyrrhocorax pyrrhocorax</i>		Europe: Germany	7
	Emberizidae	<i>Emberiza schoeniclus</i>	Wild	Europe: Austria	9
	Estrildidae	<i>Amandava amandava</i>	Invasive	Europe: Spain	4
		<i>Erythrura prasina</i>	Captive	Europe: Germany	12
		<i>Mandingoa nitidula</i>	Captive	Europe: Germany	12
		<i>Taeniopygia guttata</i>	Captive	Europe: Germany	12
	Fringillidae	<i>Chloris chloris</i>	Wild	Europe: Switzerland	13
		<i>Chlorophonia occipitalis</i>	Captive	Europe: Germany	12
		<i>Fringilla coelebs</i>	Wild	Europe: Belgium	2
		<i>Pyrrhula erythaca</i>	Captive?	Europe: Germany	10
		<i>Pyrrhula pyrrhula</i>	Wild	Europe: Germany	10
		<i>Serinus canaria domestica</i>	Captive?	Europe: Germany	9, 11
	Hirundidae	<i>Delichon urbicum</i>	Wild	Europe: Spain	4, 9
		<i>Hirundo rustica</i>	Wild	Europe: Austria	9
	Laniidae	<i>Lanius senator</i>	Wild	Europe: Spain	4

	Motacillidae	<i>Motacilla alba</i>	Wild	Europe: Belgium	2
	Muscicapidae	<i>Erithacus rubecula</i>	Wild	Europe: Austria	9, 13
		<i>Ficedula hypoleuca</i>	Wild	Europe: Austria	5, 9
		<i>Luscinia megarhynchos</i>	Wild	Europe: Spain	4
		<i>Phoenicurus ochruros</i>	Wild	Europe: Austria	9, 10
	Paridae	<i>Cyanistes caeruleus</i>	Wild	Europe: Switzerland	13
		<i>Parus major</i>	Wild	Europe: Austria	5, 9
		<i>Periparus ater</i>		Europe: Germany	7
	Passeridae	<i>Passer domesticus</i>	Wild	Europe: Switzerland	10, 13
	Pycnonotidae	<i>Eurillas virens</i>	Wild	Africa: Nigeria	11
	Sittidae	<i>Sitta europaea</i>	Wild	Europe: Austria	5, 9
	Sturnidae	<i>Lamprotornis regius</i>		Europe: Germany	7
		<i>Sturnus vulgaris</i>	Wild	Europe: Austria	9, 10
	Sylviidae	<i>Sylvia atricapilla</i>	Wild	Europe: Austria	4, 9
		<i>Sylvia borin</i>	Wild	Europe: Austria	9
		<i>Sylvia communis</i>	Wild	Europe: Austria	9
		<i>Sylvia curruca</i>	Wild	Europe: Austria	9
	Troglodytidae	<i>Troglodytes troglodytes</i>	Wild	Europe: Belgium	1
	Turdidae	<i>Turdus libonyana</i>	Wild	Africa: Nigeria	11
		<i>Turdus merula</i>	Wild	Europe: Italy	1, 2, 4, 6, 9, 10, 12, 13, 14, 15
		<i>Turdus philomelos</i>	Wild	Europe: Austria	2, 8, 9, 10
		<i>Turdus pilaris</i>		Europe: Germany	7
Pelecaniformes	Ardeidae	<i>Ardea cinerea</i>		Europe: Germany	7
Piciformes	Picidae	<i>Dendrocopos major</i>	Wild	Europe: Austria	9, 10
		<i>Picus viridis</i>		Europe: Germany	7
Phoenicopteriformes	Phoenicopteridae	<i>Phoenicoparrus chilensis</i>		Europe: Germany	7
		<i>Phoenicopterus ruber</i>	Captive	Europe: Germany	3
Psittaciformes	Cactuidae	<i>Calyptrorhynchus banksii</i>	Captive	Europe: Germany	12

		<i>Calyptrorhynchus baudinii</i>	Captive	Europe: Germany	12
Sphenisciformes	Spheniscidae	<i>Spheniscus humboldti</i>	Captive	Europe: Switzerland	3
Strigiformes	Strigidae	<i>Aegolius funereus</i>	Captive	Europe: Switzerland	13
		<i>Asio otus</i>	Wild	Europe: Austria	9
		<i>Athene noctua</i>	Wild	Europe: Germany	10
		<i>Bubo bubo</i>	Captive	Europe: Austria	3, 9
		<i>Bubo scandiacus</i>	Captive	Europe: Austria	3
		<i>Glaucidium passerinum</i>	Captive	Europe: Switzerland	2, 13
		<i>Strix aluco</i>	Wild	Europe: Austria	9
		<i>Strix nebulosa</i>	Captive	Europe: Switzerland	10, 13
		<i>Strix uralensis</i>	Captive?	Europe: Austria	3, 9
		<i>Surnia ulula</i>	Captive	Europe: Switzerland	13
	Tytonidae	<i>Tyto alba</i>	Wild	Europe: Austria	9

SUPPLEMENTARY TABLE S4b: summary of detections in avian orders showing the number of positive families and species in each order, and the percent of total detections for the order.

Order	# of USUV positive families	# of USUV positive species	% of total USUV detections
Accipitriformes	1	8	8
Anseriformes	1	11	11
Apodiformes	1	1	1
Bucerotiformes	1	1	1
Charadriiformes	1	2	2
Ciconiiformes	1	2	2
Columbiformes	1	3	3
Coraciiformes	1	2	2
Falconiformes	1	1	1

Galliformes	1	4	4
Passeriformes	17	46	46
Pelecaniformes	1	1	1
Piciformes	1	2	2
Phoenicopteriformes	1	2	2
Psittaciformes	1	2	2
Sphenisciformes	1	1	1
Strigiformes	2	11	11

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