

Supplementary material

Appendix 1

Table A1. List of 278 phylogenetically independent pairs of species (complete dataset) used to examine difference in divergence in *cyt b* and COI (*cyt b*/COI index) across ten avian orders. The table shows the species compared, the uncorrected p-distances estimated for both loci with the corresponding number of sequences analyzed, and the value of the *cyt b*/COI index for each comparison. Positive index values indicate higher divergence in *cyt b* than in COI, whereas negative values are the reverse.

Order	Pairs of species	COI divergence (%)	<i>cyt b</i> divergence (%)	<i>cyt b</i> /COI index (%)	COI sequences	<i>cyt b</i> sequences
Anseriformes	<i>Anas flavirostris</i> vs <i>Anas crecca</i>	3.9	5.4	38.5	18	2
	<i>Anas acuta</i> vs <i>Anas platyrhynchos</i>	6.1	6.3	3.3	22	2
	<i>Anas sibilatrix</i> vs <i>Anas penelope</i>	2.6	3.3	26.9	12	2
	<i>Anas falcata</i> vs <i>Anas strepera</i>	1.4	1.7	21.4	8	54
	<i>Anas clypeata</i> vs <i>Anas discors</i>	2.6	2.5	-4.0	18	2
	<i>Anas querquedula</i> vs <i>Anas formosa</i>	7.1	7.2	1.4	8	2
	<i>Aythya affinis</i> vs <i>Aythya marila</i>	0.2	1.6	700.0	17	2
	<i>Aythya fuligula</i> vs <i>Aythya ferina</i>	2.3	4.5	95.7	12	2
	<i>Sarkidiornis melanotos</i> vs <i>Callonetta leucophrys</i>	8.6	9.8	14.0	7	2
	<i>Tadorna ferruginea</i> vs <i>Cairina moschata</i>	9.1	9.9	8.8	7	2
	<i>Aix galericulata</i> vs <i>Aix sponsa</i>	7.5	7.6	1.3	3	2
	<i>Mergus merganser</i> vs <i>Lophodytes cucullatus</i>	6.2	7.6	22.6	17	2
	<i>Bucephala clangula</i> vs <i>Bucephala islandica</i>	1.2	3.2	166.7	13	2
	<i>Bucephala albeola</i> vs <i>Melanitta perspicillata</i>	8.2	10.1	23.2	6	2
	<i>Somateria mollissima</i> vs <i>Clangula hyemalis</i>	7.8	7.4	-5.4	19	2
	<i>Anser albifrons</i> vs <i>Anser erythropus</i>	1.3	0.7	-85.7	6	4

	<i>Anser fabalis</i> vs <i>Anser anser</i>	1.7	1.8	5.9	9	3
	<i>Anser brachyrhynchus</i> vs <i>Anser indicus</i>	1.9	1	-90.0	2	2
	<i>Chen rossi</i> vs <i>Branta bernicla</i>	7.4	8.1	9.5	12	3
	<i>Branta canadensis</i> vs <i>Branta sandvicensis</i>	0.5	1.5	200.0	100	4
	<i>Cygnus columbianus</i> vs <i>Cygnus cygnus</i>	1.2	1.1	-9.1	8	2
	<i>Cygnus olor</i> vs <i>Coscoroba coscoroba</i>	10.4	9.5	-9.5	8	2
	<i>Oxyura jamaicensis</i> vs <i>Dendrocygna viduata</i>	13	13.5	3.8	8	2
	<i>Chaetura pelagica</i> vs <i>Chaetura vauxi</i>	3.3	4.3	28.1	8	3
Apodiformes	<i>Aerodramus mearnsi</i> vs <i>Collocalia esculenta</i>	11	9.4	-14.9	2	22
	<i>Apus apus</i> vs <i>Hirundapus caudacutus</i>	10.7	10	-6.5	9	3
	<i>Cerorhinca monocerata</i> vs <i>Fratercula cirrhata</i>	4.5	4.7	4.4	7	2
	<i>Fratercula arctica</i> vs <i>Fratercula corniculata</i>	1.5	2.9	93.3	11	5
	<i>Aethia pusilla</i> vs <i>Aethia psittacula</i>	6.2	4.8	-29.2	5	2
	<i>Aethia pygmaea</i> vs <i>Aethia cristatella</i>	6.2	6	-3.3	8	2
	<i>Glareola pratincola</i> vs <i>Ptychoramphus aleutic</i>	13.6	14.4	5.9	3	3
	<i>Synthliboramphus hypoleucus</i> vs <i>Synthliboramphus craveri</i>	1.5	1.1	-36.4	3	2
	<i>Synthliboramphus antiquus</i> vs <i>Synthliboramphus wumizusume</i>	3.5	4.2	20.0	9	2
	<i>Alca torda</i> vs <i>Alle alle</i>	9.6	9.4	-2.1	14	5
Charadriiformes	<i>Uria lomvia</i> vs <i>Uria lomvia</i>	5.6	6.4	14.3	17	6
	<i>Brachyramphus marmoratus</i> vs <i>Brachyramphus brevirostris</i>	6.2	5.9	-5.1	9	20
	<i>Cephus columba</i> vs <i>Cephus grylle</i>	5.2	5.5	5.8	12	4
	<i>Charadrius vociferus</i> vs <i>Charadrius semipalmatus</i>	9	8.1	-11.1	5	3
	<i>Charadrius morinellus</i> vs <i>Vanellus chilensis</i>	12.5	10.6	-17.9	12	2
	<i>Oreopholus ruficollis</i> vs <i>Pluvialis squatarola</i>	12.3	12.1	-1.7	7	2
	<i>Haematopus ostralegus</i> vs <i>Pluvianellus socialis</i>	14.2	14.7	3.5	7	3
	<i>Recurvirostra americana</i> vs <i>Himantopus mexicanus</i>	5.8	7.1	22.4	8	4
	<i>Rostratula benghalensis</i> vs <i>Attagis gayi</i>	13.9	14.2	2.2	3	4
	<i>Larus classirostris</i> vs <i>Larus heermanni</i>	2.9	2.7	-7.4	12	4

<i>Larus atricilla vs Larus pipixcan</i>	0.7	1.3	85.7	7	6
<i>Larus rudibundus vs Larus novaehollandiae</i>	0.5	1.3	160.0	8	3
<i>Rissa tridactyla vs Rissa brevirostris</i>	4.8	4.3	-11.6	12	5
<i>Pagophila eburnea vs Xema sabini</i>	6.1	5.5	20.4	6	5
<i>Calidris maritima vs Calidris ptilocnemis</i>	4.9	5.9	185.7	7	62
<i>Calidris alpina vs Tryngites subruficollis</i>	10.1	10.4	3.0	6	36
<i>Limicola falcinellus vs Philomachus pugnax</i>	10.1	10.4	12.0	12	2
<i>Calidris canutus vs Calidris tenuirostris</i>	8.3	9.3	4.2	12	2
<i>Calidris ferruginea vs Calidris himantopus</i>	7.2	7.5	10.3	5	2
<i>Tringa melanoleuca vs Arenaria interpres</i>	7.8	8.6	25.7	11	2
<i>Tringa totanus vs Tringa glareola</i>	11.3	14.2	-8.8	23	2
<i>Lymnocyptes minimus vs Limnodramus scolopaceus</i>	7.4	6.8	18.7	10	2
<i>Limosa limosa vs Limosa lapponica</i>	13.4	15.9	-4.0	11	5
<i>Limosa haemastica vs Limosa fedoa</i>	10.4	10	22.4	4	4
<i>Numenius arquata vs Numenius madagascariensis</i>	5.8	7.1	23.8	9	2
<i>Numenius phaeopus vs Bartramia longicauda</i>	4.2	5.2	12.4	12	4
<i>Stercorarius longicaudus vs vs Stercorarius parasiticus</i>	12.1	13.6	67.2	17	2
<i>Chlidonias niger vs Chlidonias leucoptera</i>	6.1	10.2	81.3	11	3
<i>Gelochelidon nilotica vs Hydroprogne caspia</i>	1.6	2.9	0.0	16	2
<i>Onychoprion fuscatus vs Onychoprion anaethetus</i>	8.7	8.7	15.5	3	2
<i>Onychoprion aleuticus vs Sternula albifrons</i>	5.8	6.7	-8.2	18	2
<i>Sternula antillarum vs Sternula superciliaris</i>	10.6	9.8	-2.6	7	2
<i>Sterna hirundo vs Sterna paradisea</i>	4	3.9	-1.8	16	2
<i>Sterna forsteri vs Sterna trudeaui</i>	5.7	5.6	32.3	4	2
<i>Thalasseus maximus vs Chlidonias hybridus</i>	3.1	4.1	-9.2	6	2
<i>Larus minutus vs Rhodostethia rosea</i>	8.3	7.6	-10.9	4	3
<i>Larus philadelphia vs Larus genei</i>	3.4	4.4	29.4	2	2
<i>Larus delawarensis vs L. glaucescens</i>	1.2	1.3	8.3	2	5

	<i>Phalaropus fulicularia vs Xeneus cinereus</i>	14.4	13.1	-9.9	10	2
	<i>Gallinago nigripennis vs Gallinago paraguayae</i>	3.9	3.8	-2.6	5	2
	<i>Gallinago sternura vs Gallinago imperialis</i>	12.2	12	-1.7	10	2
	<i>Numenius americanus vs Numenius minutus</i>	11.2	7.9	-41.8	4	2
	<i>Thinocorus orbignyianus vs Pedionomus torquatus</i>	12	12.8	6.7	8	2
	<i>Columba livia vs Columba rupestris</i>	2	1.6	-25.0	21	5
	<i>Columba oenas vs Columba palumbus</i>	7.1	10	40.8	10	9
	<i>Streptopelia turtur vs Streptopelia orientalis</i>	2.7	4.5	66.7	17	2
	<i>Streptopelia capicola vs Streptopelia chinensis</i>	13.4	12.1	-10.7	5	3
	<i>Patagioenas flavirostris vs Patagioenas speciosa</i>	8.3	6.7	-23.9	3	2
	<i>Patagioenas fasciata vs Reinwardtoena browni</i>	12.4	10.9	-13.8	3	2
	<i>Turacoeana manadensis vs Macropygia amboinensis</i>	9.3	8	-16.3	2	2
	<i>Leptotila verreauxi vs Geotrygon montana</i>	12.3	11.6	-6.0	23	9
	<i>Zenaida auriculata vs Zenaida macroura</i>	3.1	5.1	64.5	15	5
Columbiformes	<i>Columbina inca vs Columbina picui</i>	7.8	8.8	12.8	12	2
	<i>Chalcophaps stephani vs Chalcophaps indica</i>	9.9	8.2	-20.7	2	4
	<i>Phapitreon amethystinus vs Phapitreon leucotis</i>	9.3	10.8	16.1	3	3
	<i>Oena capensis vs Turtur chalcopilos</i>	11.7	12	2.6	2	3
	<i>Gymnophaps albertisii vs Lopholaimus antarcticus</i>	7.3	9.1	24.7	2	3
	<i>Hemiphaga novaeseelandiae vs Ptilinopus pulchellus</i>	11.5	9.7	-18.6	2	4
	<i>Ducula rufigaster vs Treron calvus</i>	13.2	14.5	9.8	2	2
	<i>Caloenas nicobarica vs Goura cristata</i>	12.6	12.6	0.0	2	2
	<i>Geophaps lophotes vs Petrophassa albipennis</i>	8.4	10.8	28.6	2	2
	<i>Geopelia striata vs Gallicolumba jobiensis</i>	9.3	10.3	10.8	5	3
	<i>Metriopelia morenoi vs Uropelia campestris</i>	11	9.6	-14.6	2	2
	<i>Falco peregrinus vs Falco mexicanus</i>	4.6	6.5	41.3	13	20
Falconiformes	<i>Falco femoralis vs Falco subbuteo</i>	8.6	9.2	7.0	17	8
	<i>Falco naumanni vs Falco tinnunculus</i>	7	7.9	12.9	20	9

	<i>Milvago chimachima vs Caracara plancus</i>	8.6	7.6	-13.2	7	3
	<i>Buteogallus anthracinus vs Buteogallus urubitinga</i>	4.1	5.5	34.1	5	4
	<i>Parabuteo unicinctus vs Buteo leucorrhous</i>	5.5	6.9	25.5	4	6
	<i>Geranoneutus melanoleucus vs Buteo polysoma</i>	3	2.2	-36.4	2	4
	<i>Buteo magnirostris vs Buteo albicaudatus</i>	5.6	6.7	19.6	9	3
	<i>Buteo platypterus vs Buteo lineatus</i>	4.5	5.3	17.8	9	4
	<i>Buteo swainsoni vs Buteo brachyurus</i>	1.2	1.6	33.3	3	4
	<i>Buteo albonotatus vs Buteo jamaicensis</i>	1.9	4.5	136.8	3	4
	<i>Buteo buteo vs Buteo lagopus</i>	1.3	2.4	84.6	16	4
Accipitriformes	<i>Pandion haliaetus vs Elanus leucurus</i>	15.3	15.7	2.6	10	4
	<i>Pernis apivorus vs Elanoides forficatus</i>	14.3	13.2	-8.3	3	3
	<i>Aegypius monachus vs Aquila chrysaetos</i>	13.7	12.3	-11.4	7	8
	<i>Accipiter bicolor vs Accipiter cooperii</i>	3.5	3.6	2.9	5	2
	<i>Circus aeruginosus vs Accipiter gentilis</i>	10.7	12.2	14.0	14	4
	<i>Accipiter gularis vs Accipiter nisus</i>	13.5	11.1	-21.6	14	2
	<i>Milvus migrans vs Milvus milvus</i>	1.2	1.6	33.3	4	45
	<i>Haliaeetus leucocephalus vs Haliaeetus albicilla</i>	2.4	2.5	4.2	6	5
	<i>Ictinia plumbea vs Ictinia mississippiensis</i>	4.4	3.6	-22.2	5	4
	<i>Genarospiza caerulescens vs Rosthranus sociabilis</i>	9.7	8.6	-12.8	3	5
	<i>Mitu salvini vs Mitu tuberosum</i>	0.9	2.6	188.9	5	2
	<i>Perdix perdix vs Perdix dauurica</i>	3.5	4.5	28.6	11	8
	<i>Tetrao urogallus vs Tetrao tetrix</i>	4.7	6.4	36.2	14	2
Galliformes	<i>Lagopus lagopus vs Lagopus muta</i>	4.8	6.2	29.2	37	43
	<i>Alectoris chukar vs Alectoris philbyi</i>	2.2	3.8	72.7	10	100
	<i>Colinus virginianus vs Oreortyx pictus</i>	12.5	10.7	-16.8	3	3
	<i>Coturnix japonica vs Gallus gallus</i>	14.7	13.4	-9.7	6	24
	<i>Phasianus colchicus vs Falcipennis canadensis</i>	17.3	13.5	-28.1	18	55
Piciformes	<i>Ramphastos dicolorous vs Ramphastos toco</i>	8.4	10.7	27.4	2	7

	<i>Pteroglossus flavirostris vs Pteroglossus castanotis</i>	4.8	3	-60.0	3	5
	<i>Indicator variegatus vs Megalaina haemacephala</i>	13.6	17.5	28.7	2	3
	<i>Jynx torquilla vs Sasia abnormis</i>	17.9	17.7	-1.1	7	3
	<i>Mulleripicus funebris vs Chrysocolaptes lucidus</i>	12.3	13.8	12.2	3	2
	<i>Picumnus cirratus vs Picumnus aurifrons</i>	5.6	8.1	44.6	6	4
	<i>Melanerpes carolinus vs Sphyrapicus varius</i>	10.7	14.5	35.5	7	9
	<i>Dendropicos griseocephalus vs Dendropicos fuscescens</i>	11.8	9	-31.1	2	4
	<i>Dendrocopos major vs Dendrocopos kizuki</i>	11.9	11	-8.2	14	3
	<i>Picoides albolarvatus vs Picoides villosus</i>	4	4.6	15.0	17	103
	<i>Picoides lignarius vs Picoides mixtus</i>	2	1.4	-42.9	4	3
	<i>Picoides nuttallii vs Picoides scalaris</i>	1	1	0.0	11	4
	<i>Picoides arcticus vs Picoides tridactylus</i>	12.3	12.6	2.4	9	6
	<i>Veniliornis callonotus vs Veniliornis nigriceps</i>	4.4	4.1	-7.3	2	6
	<i>Veniliornis frontalis vs Veniliornis passerinus</i>	0.3	0.7	133.3	4	4
	<i>Campephilus guatemalensis vs Campephilus pollens</i>	5.5	7	27.3	2	3
	<i>Campephilus leucopogon vs Campephilus haematogaster</i>	7.9	8.5	7.6	8	3
	<i>Picus canus vs Picus viridis</i>	5.2	5.3	1.9	16	4
	<i>Picus miniaceus vs Meiglyptes tukki</i>	11.4	11.9	4.4	2	2
	<i>Dryocopus lineatus vs Dryocopus pileatus</i>	5.8	6.2	6.9	6	4
	<i>Celeus elegans vs Celeus flavus</i>	9.8	7.4	-32.4	2	2
	<i>Colaptes atricollis vs Piculus rubiginosus</i>	3.2	4	25.0	2	6
	<i>Colaptes auratus vs Piculus chrysochloros</i>	9.4	11.3	22.8	7	8
	<i>Colaptes melanochloros vs Piculus rivolii</i>	5.5	6.3	14.5	5	5
	<i>Colaptes pitius vs Colaptes rupicola</i>	3.7	5.2	40.5	4	4
	<i>Aegolius acadicus vs Aegolius funereus</i>	11.3	13.1	15.9	15	38
Strigiformes	<i>Athene cunicularia vs Athene noctua</i>	16.3	13.9	-17.3	12	6
	<i>Surnia ulula vs Tyto alba</i>	17.3	24.1	39.3	8	6
	<i>Glaucidium nanum vs Glaucidium hardyi</i>	4	6.8	70.0	3	3

<i>Myiarchus swainsoni</i> vs <i>Myiarchus tyrannulus</i>	6.6	7.9	19.7	22	2
<i>Tyrannus melancholicus</i> vs <i>Ramphotrigon megacephalum</i>	13.6	14.4	5.9	13	2
<i>Capsiempis flaveola</i> vs <i>Myiopagis viridicata</i>	14.9	15.2	2.0	11	2
<i>Hemitriccus margaritaceiventer</i> vs <i>Todirostrum cinereum</i>	10.6	13	22.6	15	2
<i>Elaenia flavogaster</i> vs <i>Elaenia chirigensis</i>	11	12.9	17.3	10	2
<i>Serophaga subcristata</i> vs <i>Myiobius barbatus</i>	17.7	18.2	2.8	11	2
<i>Platyrinchus mystaceus</i> vs <i>Platyrinchus platyrhynchos</i>	15.2	15.9	4.6	8	2
<i>Leptopogon amaurocephalus</i> vs <i>Mionectes rufiventris</i>	15.3	14.6	-4.8	25	4
<i>Fringilla coelebs</i> vs <i>Fringilla montifringilla</i>	8	6.9	-15.9	22	34
<i>Pinicola enucleator</i> vs <i>Pyrrhula pyrrhula</i>	9.3	10	7.5	44	30
<i>Carpodacus mexicanus</i> vs <i>Carpodacus erythrinus chequedo</i>	12.9	8.7	-48.3	29	2
<i>Carpodacus roseus</i> vs <i>Uragus sibiracus</i>	8.4	7.5	-12.0	16	6
<i>Loxia curvirostra</i> vs <i>Loxia leucoptera</i>	2.3	1.9	-21.1	20	11
<i>Carduelis spinus</i> vs <i>Carduelis pinus</i>	1.8	2.2	22.2	28	6
<i>Carduelis sinica</i> vs <i>Carduelis chloris</i>	3.9	2.7	-44.4	19	4
<i>Cyanocompsa brissonii</i> vs <i>Passerina cyanea</i>	8.5	7.3	-16.4	13	4
<i>Passerina caerulea</i> vs <i>Passerina amonea</i>	4.9	4.9	0.0	8	4
<i>Passerina ciris</i> vs <i>Passerina versicolor</i>	3.7	2.9	-27.6	4	4
<i>Spiza americana</i> vs <i>Pheucticus aureoventris</i>	9.6	10.8	12.5	4	2
<i>Pheucticus ludovicianus</i> vs <i>Pheucticus melanocephalus</i>	4.6	4.6	0.0	9	4
<i>Piranga olivacea</i> vs <i>Piranga rubra</i>	7.3	6.5	-12.3	5	55
<i>Piranga ludoviciana</i> vs <i>Piranga flava</i>	6.5	6.3	-3.2	5	14
<i>Cardinalis cardinalis</i> vs <i>Habia rubica</i>	11.8	11.6	-1.7	13	5
<i>Ammodramus nelsoni</i> vs <i>Ammodramus maritimus</i>	2.5	2.9	16.0	4	2
<i>Amphispiza belli</i> vs <i>Poocetes gramineus</i>	7.5	7	-7.1	4	55
<i>Ammodramus humeralis</i> vs <i>Ammodramus savannarum</i>	6.4	6.4	0.0	5	2
<i>Melospiza lincolnii</i> vs <i>Melospiza georgiana</i>	2.7	2.8	3.7	23	4
<i>Melospiza melodia</i> vs <i>Passerculus sandwichensis</i>	7.1	5.6	-26.8	40	68

<i>Pipilo erythrophthalmus</i> vs <i>Pipilo maculatus</i>	0.6	0.6	0.0	9	2
<i>Pipilo aberti</i> vs <i>Pipilo crissalis</i>	1.8	1.9	5.6	3	2
<i>Pipilo fuscus</i> vs <i>Atlapetes citrinellus</i>	8.1	7	-15.7	4	2
<i>Spizella breweri</i> vs <i>Spizella pusilla</i>	4.7	4.6	-2.2	15	8
<i>Spizella passerina</i> vs <i>Spizella pallida</i>	5.2	6.2	19.2	15	3
<i>Amphispiza bilineata</i> vs <i>Calamospiza melanocorys</i>	9.1	9.4	3.3	9	2
<i>Junco hyemalis</i> vs <i>Passerella iliaca</i>	9	8.5	-5.9	57	3
<i>Aimophila cassini</i> vs <i>Arremonops rufivirgatus</i>	10.7	8	-33.8	11	3
<i>Emberiza tristami</i> vs <i>Emberiza variabilis</i>	3	4.2	40.0	9	5
<i>Emberiza pusilla</i> vs <i>Emberiza spodocephala</i>	6.7	7.1	6.0	26	7
<i>Emberiza schoeniclus</i> vs <i>Emberiza pallasi</i>	4.4	5.5	25.0	25	6
<i>Emberiza yessoensis</i> vs <i>Emberiza elegans</i>	10	9.8	-2.0	7	5
<i>Emberiza hortulana</i> vs <i>Emberiza buchanani</i>	5.8	7.2	24.1	4	2
<i>Emberiza cioides</i> vs <i>Emberiza cia</i>	3.4	4.3	26.5	6	6
<i>Emberiza calandra</i> vs <i>Emberiza fucata</i>	8.1	8.2	1.2	7	2
<i>Emberiza melanocephala</i> vs <i>Emberiza bruniceps</i>	5.7	5	-14.0	4	2
<i>Chlorospingus semifuscus</i> vs <i>Chlorospingus inornatus</i>	3.7	4.6	24.3	2	2
<i>Chlorospingus tacarcunae</i> vs <i>Chlorospingus pileatus</i>	3.8	6.3	65.8	2	4
<i>Quiscalus mexicanus</i> vs <i>Molothrus ater</i>	8.8	7.3	-20.5	14	4
<i>Icterus cayanensis</i> vs <i>Icterus bullockii</i>	7.7	7	-10.0	11	13
<i>Sturnella magna</i> vs <i>Dolichonyx oryzovorvus</i>	11.1	11.8	6.3	9	2
<i>Seiurus aurocapilla</i> vs <i>Helmitheros vermivorus</i>	9.6	9.6	0.0	14	8
<i>Seiurus motacilla</i> vs <i>Seiurus noveboracensis</i>	4.8	5.3	10.4	23	5
<i>Vermivora chrysoptera</i> vs <i>Vermivora pinus</i>	2.9	3.2	10.3	5	5
<i>Protonotaria citrea</i> vs <i>Limnothlypis swainsonii</i>	7.1	7.9	11.3	6	8
<i>Vermivora peregrina</i> vs <i>Vermivora celata</i>	6.2	6.5	4.8	24	8
<i>Vermivora crissalis</i> vs <i>Vermivora luciae</i>	1.5	2.4	60.0	3	5
<i>Vermivora ruficapilla</i> vs <i>Vermivora virginiae</i>	2.1	1.8	-16.7	6	7

<i>Oporornis agilis</i> vs <i>Geothlypis aequinoctialis</i>	6.4	7.6	18.8	3	9
<i>Oporornis tolmiei</i> vs <i>Oporornis philadelphia</i>	1.8	2.2	22.2	12	5
<i>Oporornis formosus</i> vs <i>Geothlypis trichas</i>	5.2	7.3	40.4	18	18
<i>Wilsonia citrina</i> vs <i>Dendroica caerulescens</i>	6.2	6.7	8.1	12	4
<i>Setophaga ruticilla</i> vs <i>Dendroica kirtlandii</i>	5.5	7.1	29.1	18	5
<i>Dendroica tigrina</i> vs <i>Dendroica cerulea</i>	5.8	5.4	-7.4	9	4
<i>Parula americana</i> vs <i>P pitayumi chequeado</i>	0.2	1.1	450.0	13	6
<i>Dendroica magnolia</i> vs <i>Dendroica petechia</i>	6.2	6.1	-1.6	53	6
<i>Dendroica castanea</i> vs <i>Dendroica fusca</i>	4.7	5.2	10.6	11	3
<i>Dendroica pensylvanica</i> vs <i>Dendroica striata</i>	2.9	4.3	48.3	27	4
<i>Dendroica palmarum</i> vs <i>Dendroica pinus</i>	4.9	6.2	26.5	14	6
<i>Dendroica coronata</i> vs <i>Dendroica dominica</i>	4.9	6	22.4	10	3
<i>Dendroica discolor</i> vs <i>Dendroica virens</i>	3.2	4.5	40.6	12	6
<i>Dendroica graciae</i> vs <i>Dendroica nigrescens</i>	0.6	1.7	183.3	5	2
<i>Basileuterus leucoblepharus</i> vs <i>Basileuterus signatus</i>	7.5	6	-25.0	4	2
<i>Basileuterus bivitattus</i> vs <i>Mniotilta varia</i>	8.1	7.2	-12.5	15	3
<i>Basileuterus culicivorus</i> vs <i>Cardelina rubrifrons</i>	6.8	7.8	14.7	3	86
<i>Wilsonia canadensis</i> vs <i>Wilsonia pusilla</i>	5.1	7.7	51.0	34	5
<i>Myioborus pictus</i> vs <i>Myioborus bruniceps</i>	5.3	7.6	43.4	4	8
<i>Phrygilus plebejus</i> vs <i>Phrygilus unicolor</i>	4.2	5.3	26.2	5	2
<i>Catamenia inornata</i> vs <i>Haplospiza unicolor</i>	9.3	10.9	17.2	4	2
<i>Sicalis luteola</i> vs <i>Sicalis flaveola</i>	8.7	7.3	-19.2	12	2
<i>Sicalis olivascens</i> vs <i>Phrygilus atriceps</i>	11.1	9.6	-15.6	12	2
<i>Poospiza erythrophrys</i> vs <i>Poospiza torquata</i>	5.4	8	48.1	6	2
<i>Poospiza hypochondria</i> vs <i>Poospiza baeri</i>	11.2	9.4	-19.1	6	2
<i>Thlypopsis ruficeps</i> vs <i>Thlypopsis sordida</i>	6.9	6.2	-11.3	6	2
<i>Tachyphonus coronatus</i> vs <i>Tachyphonus rufus</i>	5.1	5.4	5.9	5	8
<i>Emberizoides herbicola</i> vs <i>Embernagra platensis</i>	8.8	7	-25.7	7	4

<i>Coryphospingus cucullatus vs Trichothraupis melanops</i>	10.1	9.9	-2.0	9	5
<i>Thraupis bonariensis vs Pipraidea melanonota</i>	10.5	10.1	-4.0	8	5
<i>Thraupis sayaca vs Thraupis episcopus</i>	1.9	2.7	42.1	11	5
<i>Paroaria coronata vs Paroaria capitata</i>	4.9	5.9	20.4	8	24
<i>Saltator aurantirostris vs Saltator coerulescens</i>	7.3	6.6	-10.6	9	5
<i>Saltator maximus vs Saltator atriceps</i>	7.7	5.8	-32.8	2	6
<i>Oryzoborus angolensis vs Sporophila collaris</i>	9.6	5.6	-71.4	7	3
<i>Sporophila minuta vs Sporophila ruficollis</i>	6	1.9	-215.8	5	3
<i>Volatina jacarina vs Ramphocelus passerinii</i>	10.6	10.2	-3.9	8	7
<i>Diuca diuca vs Coereba flaveola</i>	12.1	9.9	-22.2	20	10

Table A2. List of the 75 phylogenetically independent pairs of species that constitute the Paired Gene Dataset used to control for any bias introduced by comparing COI and *cyt b* sequences that did not derive from the same individual in the complete dataset. The table shows the species being compared, the uncorrected p-distances estimated for both loci with the corresponding number of sequences analyzed, and the difference in divergence between *cyt b* and COI (*cyt b*/COI index) for each comparison. Positive index values indicate higher divergence in *cyt b* than in COI, whereas negative values are the reverse.

Order	Pairs of species	COI divergence (%)	<i>cyt b</i> divergence (%)	<i>cyt b</i> /COI index (%)	COI sequences	<i>cyt b</i> sequences
Anseriformes	<i>Sarkidiornis melanotos</i> vs <i>Callonetta leucophrys</i>	9.1	9.8	7.7	2	2
Falconiformes	<i>Milvago chimachima</i> vs <i>Caracara plancus</i>	8.3	6.8	-22.1	2	2
Accipitriformes	<i>Ictinia plumbea</i> vs <i>Ictinia mississippiensis</i>	4.3	3.8	-13.2	2	2
Piciformes	<i>Jynx torquilla</i> vs <i>Sasia abnormis</i>	18.2	17.7	-2.8	2	2
	<i>Picumnus cirratus</i> vs <i>Picumnus aurifrons</i>	5.4	10.7	98.1	2	2
	<i>Melanerpes carolinus</i> vs <i>Sphyrapicus varius</i>	11.1	13.8	24.3	2	2
	<i>Dendropicos griseocephalus</i> vs <i>Dendropicos fuscescens</i>	11.8	9.3	-26.9	2	2
	<i>Dendrocopos major</i> vs <i>Dendrocopos kizuki</i>	11.8	10.6	-11.3	4	4
	<i>Picoides albolarvatus</i> vs <i>Picoides villosus</i>	3.2	4.9	53.1	4	4
	<i>Picoides lignarius</i> vs <i>Picoides mixtus</i>	2	1.4	-42.9	3	3
	<i>Picoides nuttallii</i> vs <i>Picoides scalaris</i>	1.2	1	-20.0	4	4
	<i>Picoides arcticus</i> vs <i>Picoides tridactylus</i>	12.5	12.7	1.6	4	4
	<i>Veniliornis callonotus</i> vs <i>Veniliornis nigriceps</i>	4.4	4.2	-4.8	2	2
	<i>Veniliornis frontalis</i> vs <i>Veniliornis passerinus</i>	0.4	0.7	75.0	4	4
	<i>Campephilus guatemalensis</i> vs <i>Campephilus pollens</i>	5.5	6.4	16.4	2	2
	<i>Campephilus leucopogon</i> vs <i>Campephilus haematogaster</i>	7.6	8.5	11.8	3	3
	<i>Celeus elegans</i> vs <i>Celeus flavus</i>	9.8	7.4	-32.4	2	2

	<i>Colaptes atricollis vs Piculus rubiginosus</i>	3.2	4.4	37.5	5	5
	<i>Colaptes auratus vs Piculus chrysochloros</i>	9.1	11.1	22.0	4	4
	<i>Colaptes melanochloros vs Piculus rivolii</i>	6	6.4	6.7	4	4
	<i>Colaptes pitius vs Colaptes rupicola</i>	4.3	5.2	20.9	4	4
Charadriiformes	<i>Gallinago nigripennis vs Gallinago paraguaiae</i>	3.9	3.8	-2.6	2	2
	<i>Thinocorus orbignyianus vs Pedionomus torquatus</i>	11.9	12.8	7.6	2	2
Galliformes	<i>Coturnix japonica vs Gallus gallus</i>	14.3	13.5	-5.9	2	2
Columbiformes	<i>Turacoeana manadensis vs Macropygia amboinensis</i>	9.3	8	-16.3	2	2
	<i>Gymnophaps albertisii vs Lopholaimus antarcticus</i>	7.3	9.1	24.7	2	2
	<i>Hemiphaga novaeseelandiae vs Ptilinopus pulchellus</i>	13.3	10	-33.0	2	2
Passeriformes	<i>Anumbius annumbi vs Coryphistera alaudina</i>	11.2	11.3	0.9	2	2
	<i>Schoeniophylax phryganophilus vs Certhiaxis cinnamomeus</i>	8.8	9.3	5.7	2	2
	<i>Eremobius phoenicurus vs Upucerthia ruficaudus</i>	6.5	6.2	-4.8	2	2
	<i>Lepidocolaptes angustirostris vs Xiphocolaptes major</i>	10.8	12.5	15.7	2	2
	<i>Asthenes modesta vs Asthenes dorbignyi</i>	10.2	10	-2.0	2	2
	<i>Phacellodomus ruber vs Phacellodomus rufifrons</i>	7.2	6.7	-7.5	2	2
	<i>Syndactyla rufosuperciliata vs Philydor atricapillus</i>	10.2	9.5	-7.4	2	2
	<i>Pygarrhichas albogularis vs Xenops minutus</i>	14.4	14.3	-0.7	2	2
	<i>Seiurus aurocapilla vs Helmitheros vermivorus</i>	9.7	9.6	-1.0	2	2
	<i>Seiurus motacilla vs Seiurus noveboracensis</i>	5.2	5.4	3.8	2	2
	<i>Vermivora chrysoptera vs Vermivora pinus</i>	3.2	2.7	-18.5	2	2
	<i>Protonotaria citrea vs Limnithlypis swainsonii</i>	6.9	7.8	13.0	2	2
	<i>Vermivora peregrina vs Vermivora celata</i>	6.1	6.3	3.3	2	2
	<i>Vermivora crissalis vs Vermivora luciae</i>	1.5	2.5	66.7	2	2
	<i>Vermivora ruficapilla vs Vermivora virginiae</i>	1.4	1.8	28.6	2	2
	<i>Oporornis agilis vs Geothlypis aequinoctialis</i>	6.3	8	27.0	2	2
<i>Oporornis tolmiei vs Oporornis philadelphia</i>	2.3	2.3	0.0	2	2	
<i>Oporornis formosus vs Geothlypis trichas</i>	5.4	7.2	33.3	2	2	

<i>Wilsonia citrina</i> vs <i>Dendroica caerulescens</i>	5.7	6.7	17.5	2	2
<i>Setophaga ruticilla</i> vs <i>Dendroica kirtlandii</i>	5.8	7	20.7	2	2
<i>Dendroica tigrina</i> vs <i>Dendroica cerulea</i>	6.2	5.4	-14.8	2	2
<i>Parula americana</i> vs <i>Parula pitayumi</i>	0.3	1.1	266.7	2	2
<i>Dendroica magnolia</i> vs <i>Dendroica petechia</i>	5.1	6.1	19.6	2	2
<i>Dendroica castanea</i> vs <i>Dendroica fusca</i>	4.6	5.3	15.2	2	2
<i>Dendroica pensylvanica</i> vs <i>Dendroica striata</i>	3.1	4.4	41.9	2	2
<i>Dendroica palmarum</i> vs <i>Dendroica pinus</i>	5.7	6.2	8.8	2	2
<i>Dendroica coronata</i> vs <i>Dendroica dominica</i>	4.9	6	22.4	2	2
<i>Dendroica discolor</i> vs <i>Dendroica virens</i>	3.3	4.5	36.4	2	2
<i>Dendroica graciae</i> vs <i>Dendroica nigrescens</i>	0.5	1.7	240.0	2	2
<i>Basileuterus leucoblepharus</i> vs <i>Basileuterus signatus</i>	7.3	6	-21.7	2	2
<i>Basileuterus culicivorus</i> vs <i>Cardelina rubrifrons</i>	5.9	7.1	20.3	2	2
<i>Wilsonia canadensis</i> vs <i>Wilsonia pusilla</i>	5.3	7.7	45.3	2	2
<i>Myioborus pictus</i> vs <i>Myioborus brunniceps</i>	5.5	7.7	40.0	2	2
<i>Chlorospingus semifuscus</i> vs <i>Chlorospingus inornatus</i>	3.7	4.6	24.3	2	2
<i>Chlorospingus tacarcunae</i> vs <i>Chlorospingus pileatus</i>	3.8	6.3	65.8	2	2
<i>Phrygilus plebejus</i> vs <i>Phrygilus unicolor</i>	4.1	5.3	29.3	6	6
<i>Catamenia inornata</i> vs <i>Haplospiza unicolor</i>	9.2	10.3	12.0	4	4
<i>Sicalis olivascens</i> vs <i>Phrygilus atriceps</i>	11.1	10	-11.0	2	2
<i>Poospiza hypochondria</i> vs <i>Poospiza baeri</i>	11.1	9	-23.3	2	2
<i>Thlypopsis ruficeps</i> vs <i>Thlypopsis sordida</i>	6.9	6.9	0.0	2	2
<i>Tachyphonus coronatus</i> vs <i>Tachyphonus rufus</i>	5.2	5.2	0.0	2	2
<i>Emberizoides herbicola</i> vs <i>Embernagra platensis</i>	8.9	6.5	-36.9	2	2
<i>Coryphospingus cucullatus</i> vs <i>Trichothraupis melanops</i>	9.9	9.4	-5.3	2	2
<i>Thraupis bonariensis</i> vs <i>Pipraeidea melanonota</i>	10.5	9	-16.7	2	2
<i>Paroaria coronata</i> vs <i>Paroaria capitata</i>	4.9	6.2	26.5	2	2
<i>Saltator aurantiirostris</i> vs <i>Saltator coerulescens</i>	7.1	7.3	2.8	2	2

<i>Oryzoborus angolensis</i> vs <i>Sporophila collaris</i>	9.8	6.4	-53.1	2	2
<i>Diuca diuca</i> vs <i>Coereba flaveola</i>	11.5	10.2	-12.7	2	2

Table A3. List of the 75 phylogenetically independent pairs of species that constitute the Paired Gene Dataset used to control for the effect of analyzing genetic p-distances in the complete dataset. The table shows the species being compared, the model-corrected genetic distances estimated for both loci with the corresponding number of sequences analyzed and the best-fit model of nucleotide substitution that was selected and applied for each gene and order. The difference in divergence between *cyt b* and COI (*cyt b*/COI index) for each comparison is also shown. Positive index values indicate higher divergence in *cyt b* than in COI, whereas negative values are the reverse.

Order	Pairs of species	COI model selected	COI divergence (%)	<i>cyt b</i> model selected	<i>cyt b</i> divergence (%)	<i>cyt b</i> /COI index (%)	COI sequences	<i>cyt b</i> sequences
Anseriformes	<i>Sarkidiornis melanotos</i> vs <i>Callonetta leucophrys</i>	TrN+I+G	9.9	TIM2+I+G	10.8	9.090909091	2	2
Falconiformes	<i>Milvago chimachima</i> vs <i>Caracara plancus</i>	TPM2uf+I	9	HKY+G	7.29	-23.45679012	2	2
Accipitriformes	<i>Ictinia plumbea</i> vs <i>Ictinia mississippiensis</i>	TIM2+I+G	4.6	TPM2uf+I+G	3.94	-16.75126904	2	2
	<i>Jynx torquilla</i> vs <i>Sasia abnormis</i>	GTR+I+G	21.9	TPM3uf+I+G	20.7	-5.797101449	2	2
	<i>Picumnus cirratus</i> vs <i>Picumnus aurifrons</i>	GTR+I+G	5.6	TPM3uf+I+G	11.7	108.9285714	2	2
	<i>Melanerpes carolinus</i> vs <i>Sphyrapicus varius</i>	GTR+I+G	12.4	TPM3uf+I+G	15.7	26.61290323	2	2
	<i>Dendropicos griseocephalus</i> vs <i>Dendropicos fuscescens</i>	GTR+I+G	13.3	TPM3uf+I+G	10.2	-30.39215686	2	2
	<i>Dendrocopos major</i> vs <i>Dendrocopos kizuki</i>	GTR+I+G	13.9	TPM3uf+I+G	12	-15.83333333	4	4
	<i>Picoides albolarvatus</i> vs <i>Picoides villosus</i>	GTR+I+G	3.4	TPM3uf+I+G	5.6	64.70588235	4	4
Piciformes	<i>Picoides lignarius</i> vs <i>Picoides mixtus</i>	GTR+I+G	2.3	TPM3uf+I+G	1.5	-53.33333333	3	3
	<i>Picoides nuttallii</i> vs <i>Picoides scalaris</i>	GTR+I+G	1.4	TPM3uf+I+G	1	-40	4	4
	<i>Picoides arcticus</i> vs <i>Picoides tridactylus</i>	GTR+I+G	14.3	TPM3uf+I+G	14.5	1.398601399	4	4
	<i>Veniliornis callonotus</i> vs <i>Veniliornis nigriceps</i>	GTR+I+G	4.6	TPM3uf+I+G	4.4	-4.545454545	2	2
	<i>Veniliornis frontalis</i> vs <i>Veniliornis passerinus</i>	GTR+I+G	0.4	TPM3uf+I+G	0.8	100	4	4
	<i>Campephilus guatemalensis</i> vs <i>Campephilus pollens</i>	GTR+I+G	5.8	TPM3uf+I+G	6.8	17.24137931	2	2
	<i>Campephilus leucopogon</i> vs <i>Campephilus haematogaster</i>	GTR+I+G	8.3	TPM3uf+I+G	10	20.48192771	3	3

	<i>Celeus elegans vs Celeus flavus</i>	GTR+I+G	10.8	TPM3uf+I+G	8	-35	2	2
	<i>Colaptes atricollis vs Piculus rubiginosus</i>	GTR+I+G	3.9	TPM3uf+I+G	4.9	25.64102564	5	5
	<i>Colaptes auratus vs Piculus chrysochloros</i>	GTR+I+G	10.1	TPM3uf+I+G	12.4	22.77227723	4	4
	<i>Colaptes melanochloros vs Piculus rivolii</i>	GTR+I+G	6.3	TPM3uf+I+G	6.9	9.523809524	4	4
	<i>Colaptes pitius vs Colaptes rupicola</i>	GTR+I+G	4.4	TPM3uf+I+G	5.8	31.81818182	4	4
Charadriiformes	<i>Gallinago nigripennis vs Gallinago paraguayae</i>	TVM+I+G	4	TIM2+I+G	4	0	2	2
	<i>Thinocorus orbignyianus vs Pedionomus torquatus</i>	TVM+I+G	13.1	TIM2+I+G	14.6	11.45038168	2	2
Galliformes	<i>Coturnix japonica vs Gallus gallus</i>	GTR+I+G	16.4	TrN+G	15.3	-7.189542484	2	2
	<i>Turacoena manadensis vs Macropygia amboinensis</i>	GTR+I+G	10.3	TPM2uf+I+G	8.8	-17.04545455	2	2
Columbiformes	<i>Gymnophaps albertisii vs Lopholaimus antarcticus</i>	GTR+I+G	7.9	TPM2uf+I+G	10	26.58227848	2	2
	<i>Hemiphaga novaeseelandiae vs Ptilinopus pulchellus</i>	GTR+I+G	15.3	TPM2uf+I+G	11	-39.09090909	2	2
	<i>Anumbius anumbi vs Coryphistera alaudina</i>	TIM2+I+G	13	TIM2+I+G	12.9	-0.775193798	2	2
	<i>Schoeniophylax phryganophilus vs Certhiaxis cinnamomeus</i>	TIM2+I+G	9.9	TIM2+I+G	10.4	5.050505051	2	2
	<i>Eremobius phoenicurus vs Upucerthia ruficaudus</i>	TIM2+I+G	7	TIM2+I+G	6.6	-6.060606061	2	2
	<i>Lepidocolaptes angustirostris vs Xiphocolaptes major</i>	TIM2+I+G	12.6	TIM2+I+G	14.6	15.87301587	2	2
	<i>Asthenes modesta vs Asthenes dorbignyi</i>	TIM2+I+G	11.7	TIM2+I+G	11.3	-3.539823009	2	2
	<i>Phacellodomus ruber vs Phacellodomus rufifrons</i>	TIM2+I+G	7.9	TIM2+I+G	7.2	-9.722222222	2	2
	<i>Syndactyla rufosuperciliata vs Philydor atricapillus</i>	TIM2+I+G	11.8	TIM2+I+G	10.8	-9.259259259	2	2
	<i>Pygarrhichas albogularis vs Xenops minutus</i>	TIM2+I+G	16.8	TIM2+I+G	16.9	0.595238095	2	2
Passeriformes	<i>Seiurus aurocapilla vs Helminthos vermivorus</i>	TPM2uf+I+G	10.6	TPM2uf+I+G	10.5	-0.952380952	2	2
	<i>Seiurus motacilla vs Seiurus noveboracensis</i>	TPM2uf+I+G	5.4	TPM2uf+I+G	5.7	5.555555556	2	2
	<i>Vermivora chrysoptera vs Vermivora pinus</i>	TPM2uf+I+G	3.3	TPM2uf+I+G	2.8	-17.85714286	2	2
	<i>Protonotaria citrea vs Limnothlypis swainsonii</i>	TPM2uf+I+G	7.4	TPM2uf+I+G	8.4	13.51351351	2	2
	<i>Vermivora peregrina vs Vermivora celata</i>	TPM2uf+I+G	6.4	TPM2uf+I+G	6.7	4.6875	2	2
	<i>Vermivora crissalis vs Vermivora luciae</i>	TPM2uf+I+G	1.5	TPM2uf+I+G	2.6	73.33333333	2	2
	<i>Vermivora ruficapilla vs Vermivora virginiae</i>	TPM2uf+I+G	1.4	TPM2uf+I+G	1.8	28.57142857	2	2
	<i>Oporornis agilis vs Geothlypis aequinoctialis</i>	TPM2uf+I+G	6.6	TPM2uf+I+G	8.7	31.81818182	2	2
	<i>Oporornis tolmiei vs Oporornis philadelphia</i>	TPM2uf+I+G	2.3	TPM2uf+I+G	2.4	4.347826087	2	2

<i>Oporornis formosus vs Geothlypis trichas</i>	TPM2uf+I+G	5.6	TPM2uf+I+G	7.7	37.5	2	2
<i>Wilsonia citrina vs Dendroica caerulescens</i>	TPM2uf+I+G	6.1	TPM2uf+I+G	7.2	18.03278689	2	2
<i>Setophaga ruticilla vs Dendroica kirtlandii</i>	TPM2uf+I+G	6.1	TPM2uf+I+G	7.5	22.95081967	2	2
<i>Dendroica tigrina vs Dendroica cerulea</i>	TPM2uf+I+G	6.6	TPM2uf+I+G	5.7	-15.78947368	2	2
<i>Parula americana vs Parula pitayumi</i>	TPM2uf+I+G	0.3	TPM2uf+I+G	1.1	266.6666667	2	2
<i>Dendroica magnolia vs Dendroica petechia</i>	TPM2uf+I+G	5.4	TPM2uf+I+G	6.5	20.37037037	2	2
<i>Dendroica castanea vs Dendroica fusca</i>	TPM2uf+I+G	4.9	TPM2uf+I+G	5.5	12.24489796	2	2
<i>Dendroica pensylvanica vs Dendroica striata</i>	TPM2uf+I+G	3.2	TPM2uf+I+G	4.6	43.75	2	2
<i>Dendroica palmarum vs Dendroica pinus</i>	TPM2uf+I+G	6.1	TPM2uf+I+G	6.6	8.196721311	2	2
<i>Dendroica coronata vs Dendroica dominica</i>	TPM2uf+I+G	5.1	TPM2uf+I+G	6.3	23.52941176	2	2
<i>Dendroica discolor vs Dendroica virens</i>	TPM2uf+I+G	3.4	TPM2uf+I+G	4.7	38.23529412	2	2
<i>Dendroica graciae vs Dendroica nigrescens</i>	TPM2uf+I+G	0.5	TPM2uf+I+G	1.8	260	2	2
<i>Basileuterus leucoblepharus vs Basileuterus signatus</i>	TPM2uf+I+G	7.9	TPM2uf+I+G	6.4	-23.4375	2	2
<i>Basileuterus culicivorus vs Cardelina rubrifrons</i>	TPM2uf+I+G	6.2	TPM2uf+I+G	7.6	22.58064516	2	2
<i>Wilsonia canadensis vs Wilsonia pusilla</i>	TPM2uf+I+G	5.6	TPM2uf+I+G	8.3	48.21428571	2	2
<i>Myioborus pictus vs Myioborus bruniceps</i>	TPM2uf+I+G	5.7	TPM2uf+I+G	8.3	45.61403509	2	2
<i>Chlorospingus semifuscus vs Chlorospingus inornatus</i>	TPM2uf+I+G	3.8	TVM+I+G	4.9	28.94736842	2	2
<i>Chlorospingus tacarcunae vs Chlorospingus pileatus</i>	TPM2uf+I+G	4	TVM+I+G	6.8	70	2	2
<i>Phrygilus plebejus vs Phrygilus unicolor</i>	TPM3uf+I+G	4.3	TPM1uf+I+G	5.6	30.23255814	6	6
<i>Catamenia inornata vs Haplospiza unicolor</i>	TPM3uf+I+G	10.1	TPM1uf+I+G	11.4	12.87128713	4	4
<i>Sicalis olivascens vs Phrygilus atriceps</i>	TPM3uf+I+G	12.2	TPM1uf+I+G	11	-10.90909091	2	2
<i>Poospiza hypochondria vs Poospiza baeri</i>	TPM3uf+I+G	12.2	TPM1uf+I+G	9.8	-24.48979592	2	2
<i>Thlypopsis ruficeps vs Thlypopsis sordida</i>	TPM3uf+I+G	7.4	TPM1uf+I+G	7.4	0	2	2
<i>Tachyphonus coronatus vs Tachyphonus rufus</i>	TPM3uf+I+G	5.5	TPM1uf+I+G	5.4	-1.851851852	2	2
<i>Emberizoides herbicola vs Embernagra platensis</i>	TPM3uf+I+G	9.7	TPM1uf+I+G	7	-38.57142857	2	2
<i>Coryphospingus cucullatus vs Trichothraupis melanops</i>	TPM3uf+I+G	10.9	TPM1uf+I+G	10.2	-6.862745098	2	2
<i>Thraupis bonariensis vs Pipraeidea melanonota</i>	TPM3uf+I+G	11.7	TPM1uf+I+G	9.8	-19.3877551	2	2
<i>Paroaria coronata vs Paroaria capitata</i>	TPM3uf+I+G	5.1	TPM1uf+I+G	6.5	27.45098039	2	2

<i>Saltator aurantiirostris vs Saltator coerulescens</i>	TPM3uf+I+G	7.5	TPM1uf+I+G	7.8	4	2	2
<i>Oryzoborus angolensis vs Sporophila collaris</i>	TPM3uf+I+G	10.8	TPM1uf+I+G	6.8	-58.82352941	2	2
<i>Diuca diuca vs Coereba flaveola</i>	TPM3uf+I+G	12.8	TPM1uf+I+G	11.2	-14.28571429	2	2

Table A4. Mean difference in divergence between *cyt b* and COI (*cyt b*/COI index) across eight avian orders obtained from the comparison of uncorrected p-distances in 75 phylogenetically independent pairs of species from the Paired Gene Dataset. Positive index values indicate higher divergence in *cyt b* than in COI, whereas negative values are the reverse. The last two columns indicate the total number of COI and *cyt b* sequences analyzed within each order. Weighted average correspond to the global difference in divergence between the genes calculated after weighting the mean index values obtained for the different orders by the number of pair of species compared within each of them.

Order	Pairs of species	<i>cyt b</i> /COI index (%)	COI sequences	<i>cyt b</i> sequences
Anseriformes	1	7.7	2	2
Charadriiformes	2	2.5	4	4
Columbiformes	3	-8.2	6	6
Falconiformes	1	-22.1	2	2
Accipitriformes	1	-13.2	2	2
Galliformes	1	-5.9	2	2
Piciformes	18	12.6	57	57
Passeriformes	48	19.1	102	102
Total	75		177	177
Weighted average		14.5		

Table A5. Mean difference in divergence between *cyt b* and COI (*cyt b*/COI index) across eight avian orders obtained from the comparison of model-corrected genetic distances in 75 phylogenetically independent pairs of species from the Paired Gene Dataset. Positive index values indicate higher divergence in *cyt b* than in COI, whereas negative values are the reverse. The last two columns indicate the total number of COI and *cyt b* sequences analyzed within each order. Weighted average correspond to the global difference in divergence between the genes calculated after weighting the mean index values obtained for the different orders by the number of pair of species compared within each of them.

Order	Pairs of species	<i>cyt b</i> /COI index (%)	COI sequences	<i>cyt b</i> sequences
Anseriformes	1	9.1	2	2
Charadriiformes	2	5.7	4	4
Columbiformes	3	-9.9	6	6
Falconiformes	1	-23.5	2	2
Accipitriformes	1	-16.8	2	2
Galliformes	1	-7.2	2	2
Piciformes	18	13.6	57	57
Passeriformes	48	20.0	102	102
Total	75		177	177
Weighted average		15.3		

Appendix 2

Figure A1. Comparison of uncorrected p-distances for COI and *cyt b* in 164 phylogenetically independent pairs of non-passerine species and 114 pairs of passerine species. The dashed line shows equal divergence between the two loci. The red and blue lines correspond to the reduced major axis regressions for non-passerines ($\text{cyt } b = 0.9868 \cdot \text{COI} + 0.5064$, $r^2 = 0.88$, where *cyt b* and COI correspond to genetic distances in each gene) and passerines ($\text{cyt } b = 0.9904 \cdot \text{COI} + 0.1904$, $r^2 = 0.86$). Pearson correlation coefficient (r) = 0.94 ($p < 0.001$) for non-passerines, and $r = 0.93$ ($p < 0.001$) for passerines.

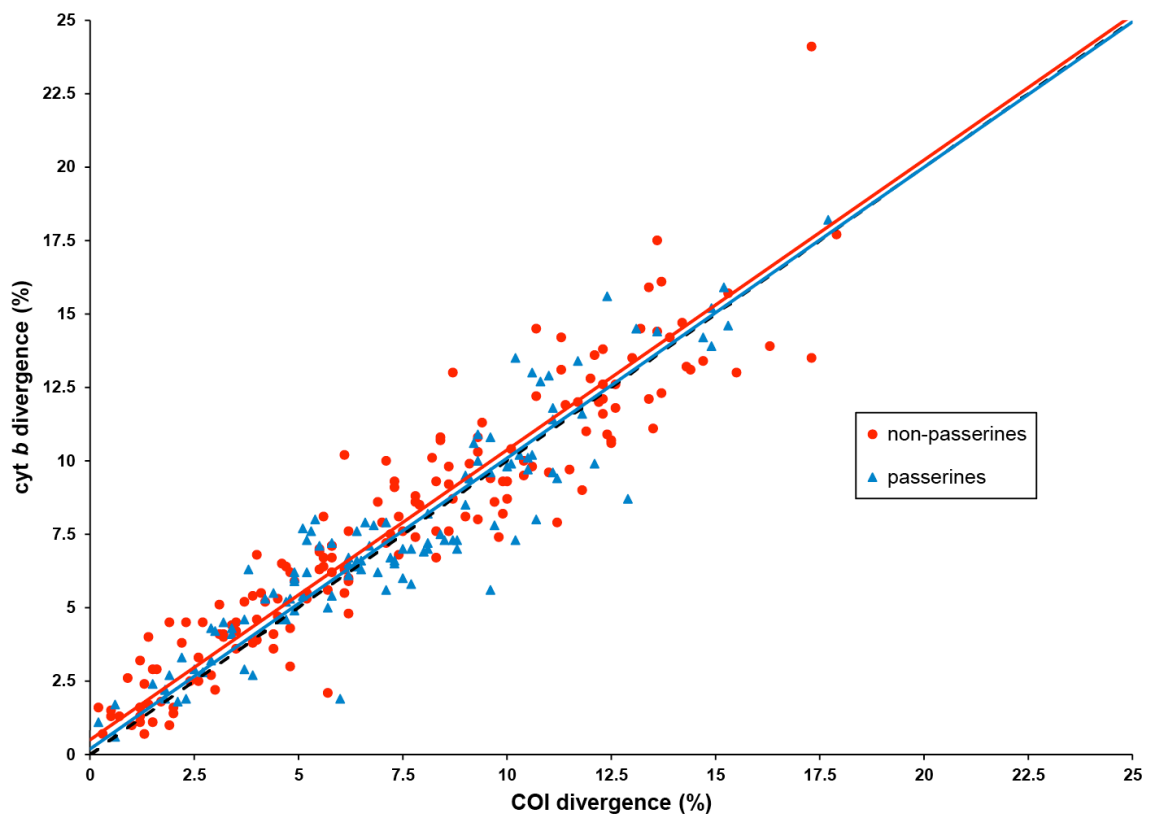


Figure A2. Decay of the difference in divergence between *cyt b* and COI (*cyt b*/COI index) as the uncorrected p-distance for COI between the species being compared increases. Positive index values indicate higher divergence in *cyt b* than in COI, whereas negative values are the reverse.

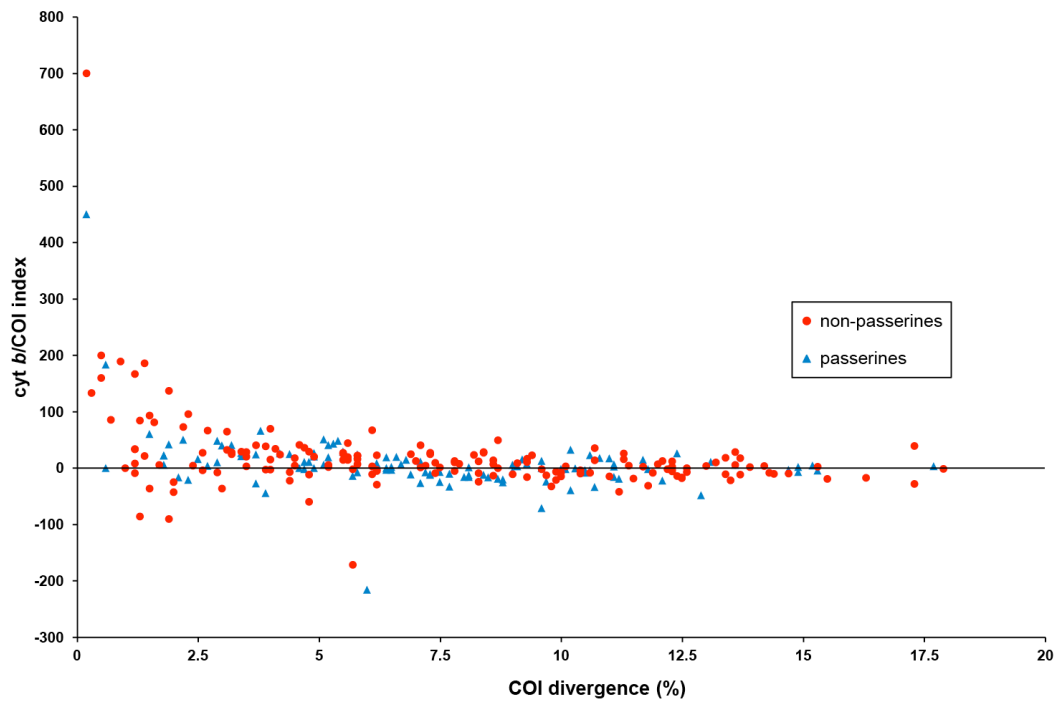


Figure A3. Association between the mean difference in divergence between *cyt b* and COI (*cyt b*/COI index) and the mean COI uncorrected p-distance for nine avian orders (passerines excluded). Pearson correlation coefficient ($r = -0.80$, $p < 0.001$). The correlation was performed after weighting the mean index values of each order by the number of pairs of species compared within each of them. Positive index values indicate higher divergence in *cyt b* than in COI.

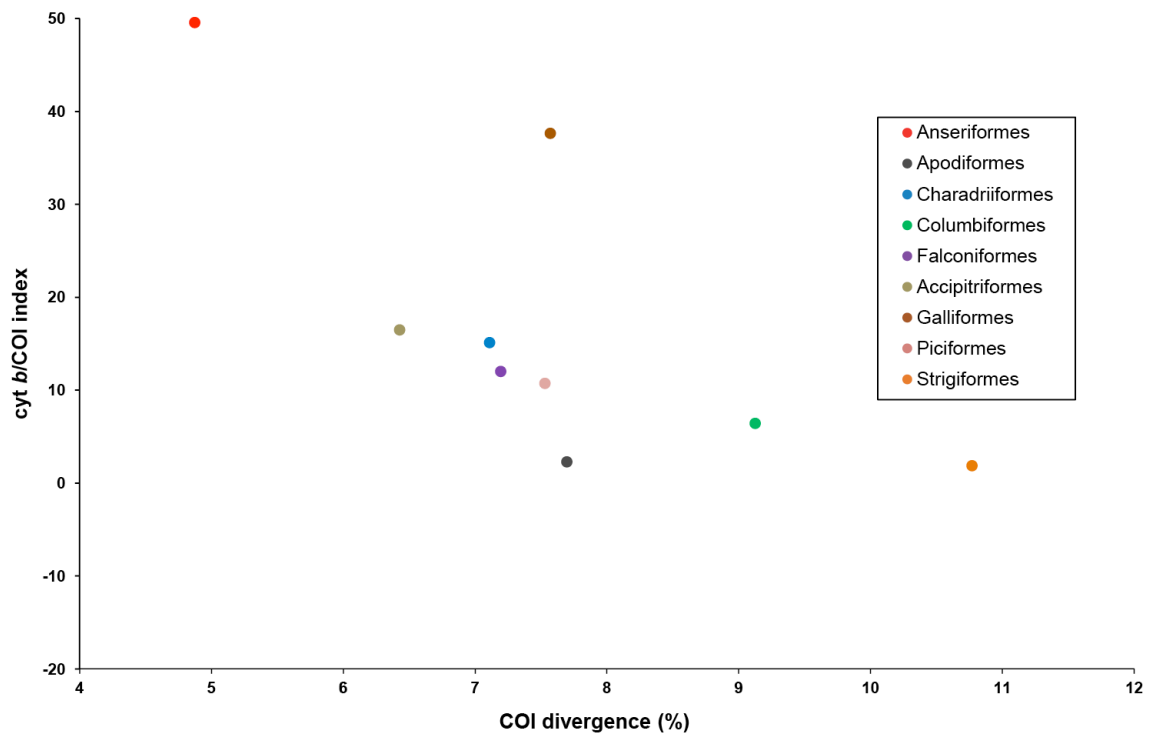


Figure A4. Comparison of uncorrected p-distances for COI and *cyt b* in 75 phylogenetically independent pairs of species that constitute the Paired Gene Dataset. The dashed line shows equal divergence between the two loci. The solid line corresponds to the reduced major axis regression ($cyt\ b = 0.9153 * COI + 0.8514$, $r^2 = 0.85$, where *cyt b* and COI correspond to genetic distances in each gene). Pearson correlation coefficient ($r = 0.92$, $p < 0.001$). Shape and colour of the symbols indicate the order to which each pair of species belongs.

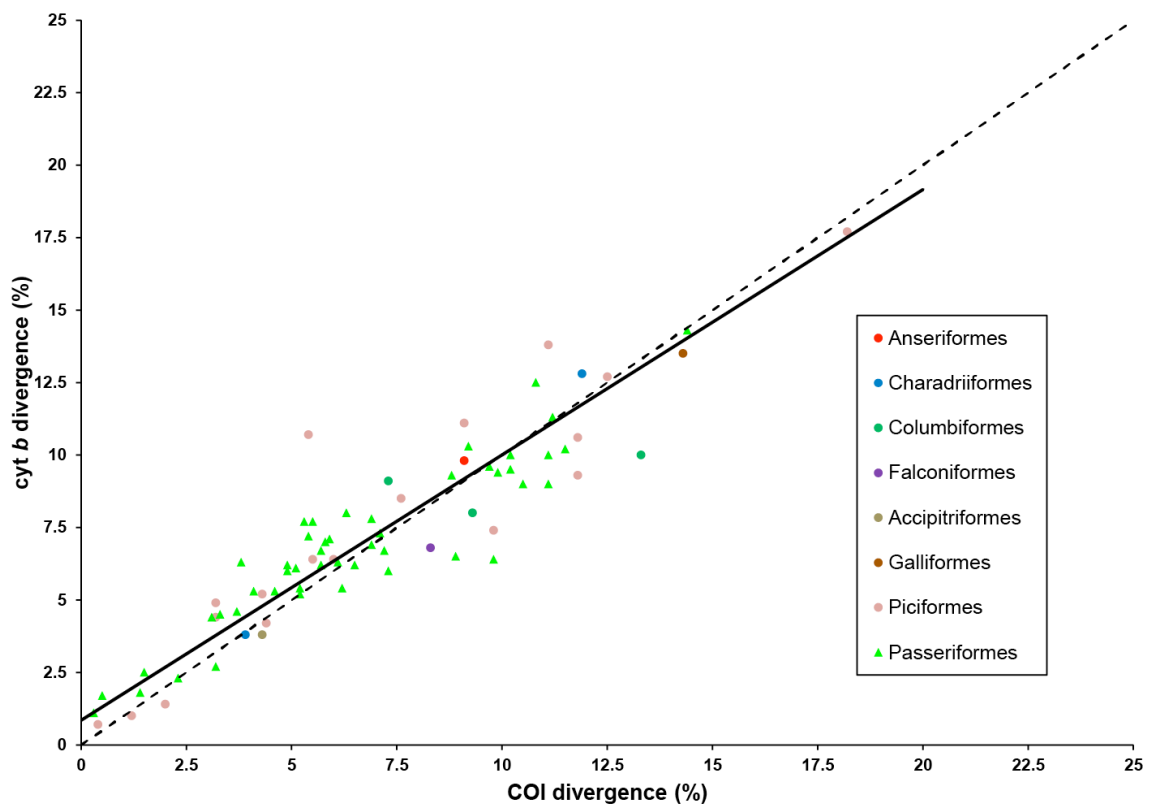


Figure A5. Decay of the difference in uncorrected p-distances between *cyt b* and COI (*cyt b*/COI index) with species divergence in 75 phylogenetically independent pairs of species from the Paired Gene Dataset. Positive index values indicate higher divergence in *cyt b* than in COI, whereas negative values are the reverse. Shape and colour of the symbols indicate the order to which each pair of species belongs.

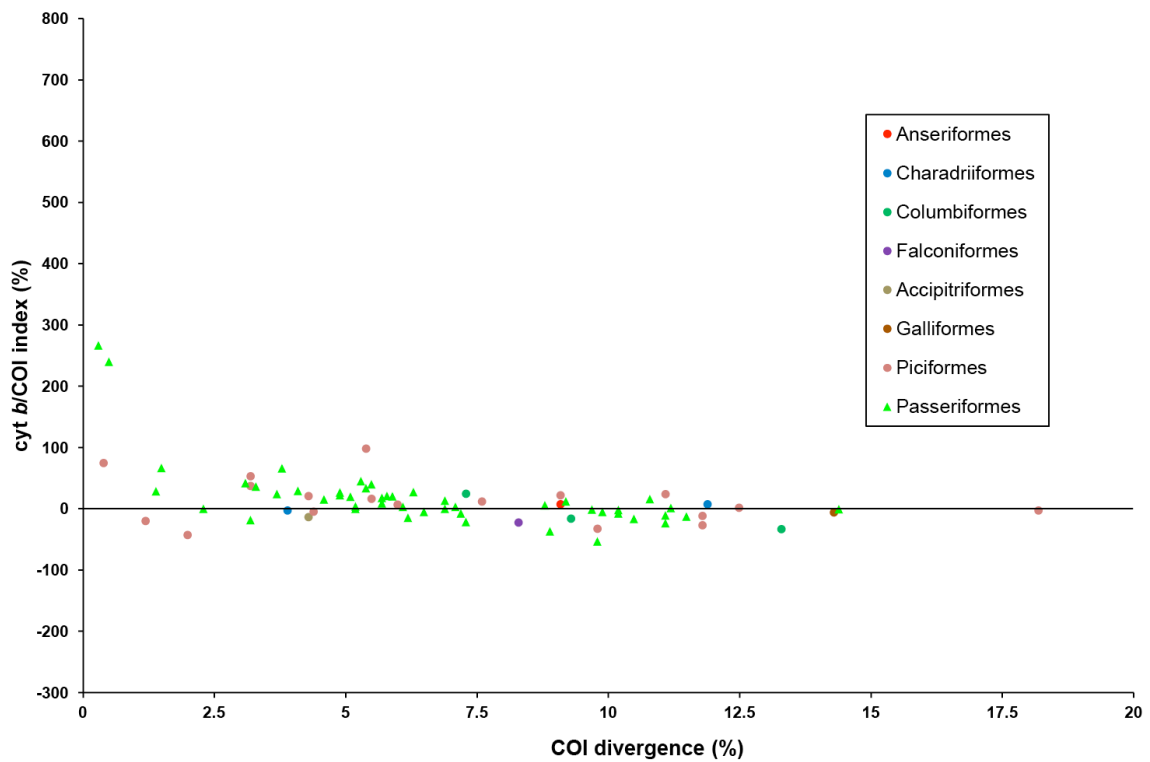


Figure A6. Association between the mean difference in divergence between *cyt b* and COI (*cyt b*/COI index) and the mean COI uncorrected p-distance for eight avian orders from the Paired Gene Dataset. Pearson correlation coefficient ($r = -0.61$, $p < 0.001$). The correlation was performed after weighting the mean index values of each order by the number of pairs of species compared within each of them. Positive index values indicate higher divergence in *cyt b* than in COI.

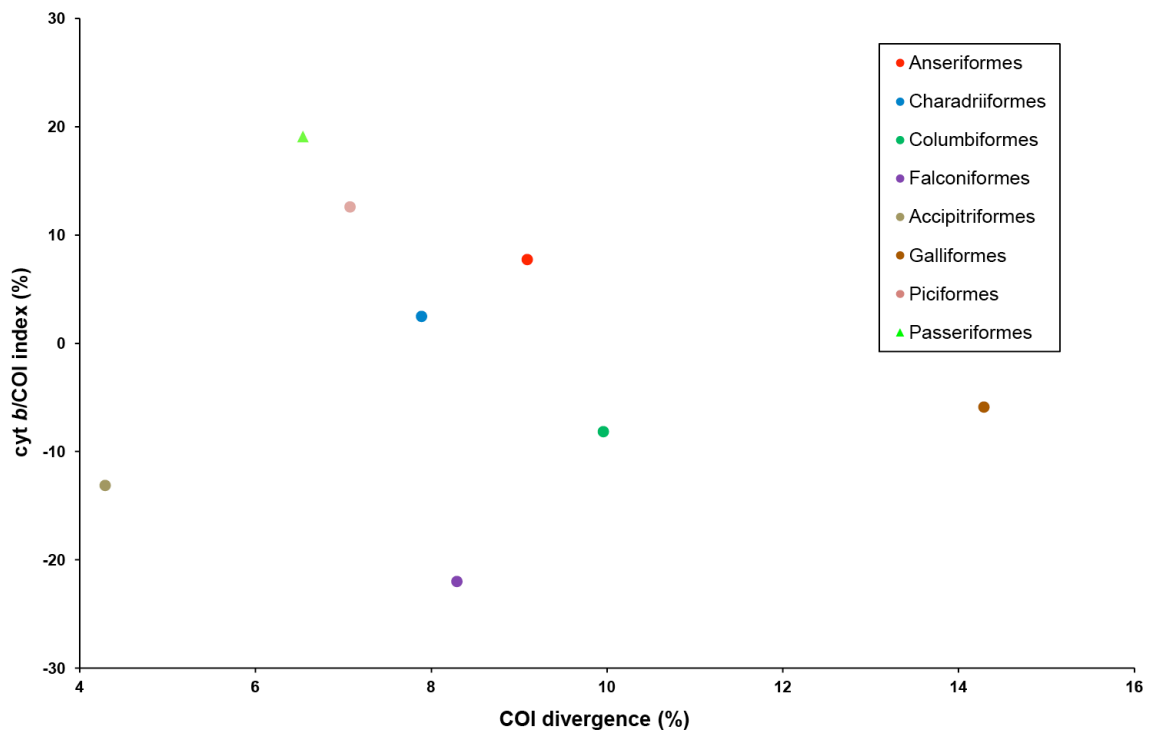


Figure A7. Comparison of model-corrected genetic distances for COI and *cyt b* in 75 phylogenetically independent pairs of species that constitute the Paired Gene Dataset. The dashed line shows equal divergence between the two loci. The solid line corresponds to the reduced major axis regression ($cyt\ b = 0.9103 * COI + 0.9613$, $r^2 = 0.85$, where *cyt b* and COI correspond to genetic distances in each gene). Pearson correlation coefficient ($r = 0.92$, $p < 0.001$). Shape and colour of the symbols indicate the order to which each pair of species belongs

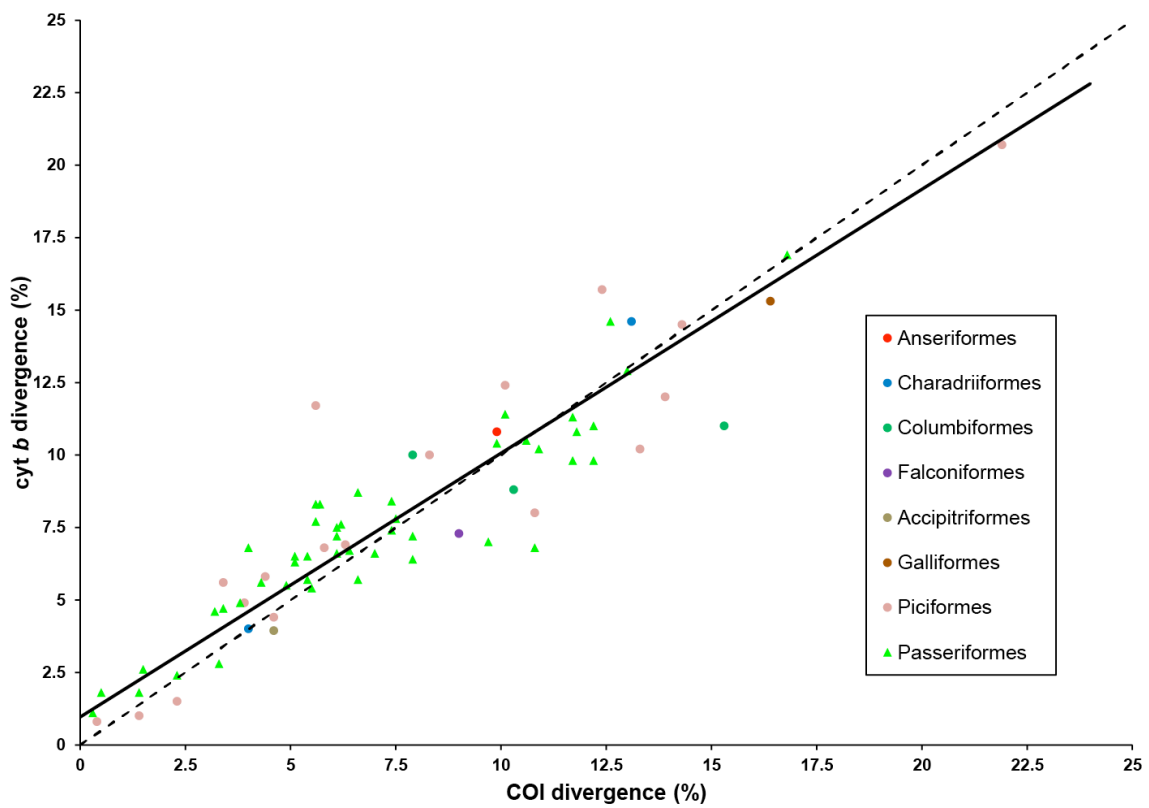


Figure A8. Decay of the difference in model corrected genetic distances between *cyt b* and COI (*cyt b*/COI index) with species divergence in 75 phylogenetically independent pairs of species from the Paired Gene Dataset. Positive index values indicate higher divergence in *cyt b* than in COI, whereas negative values are the reverse. Shape and colour of the symbols indicate the order to which each pair of species belongs.

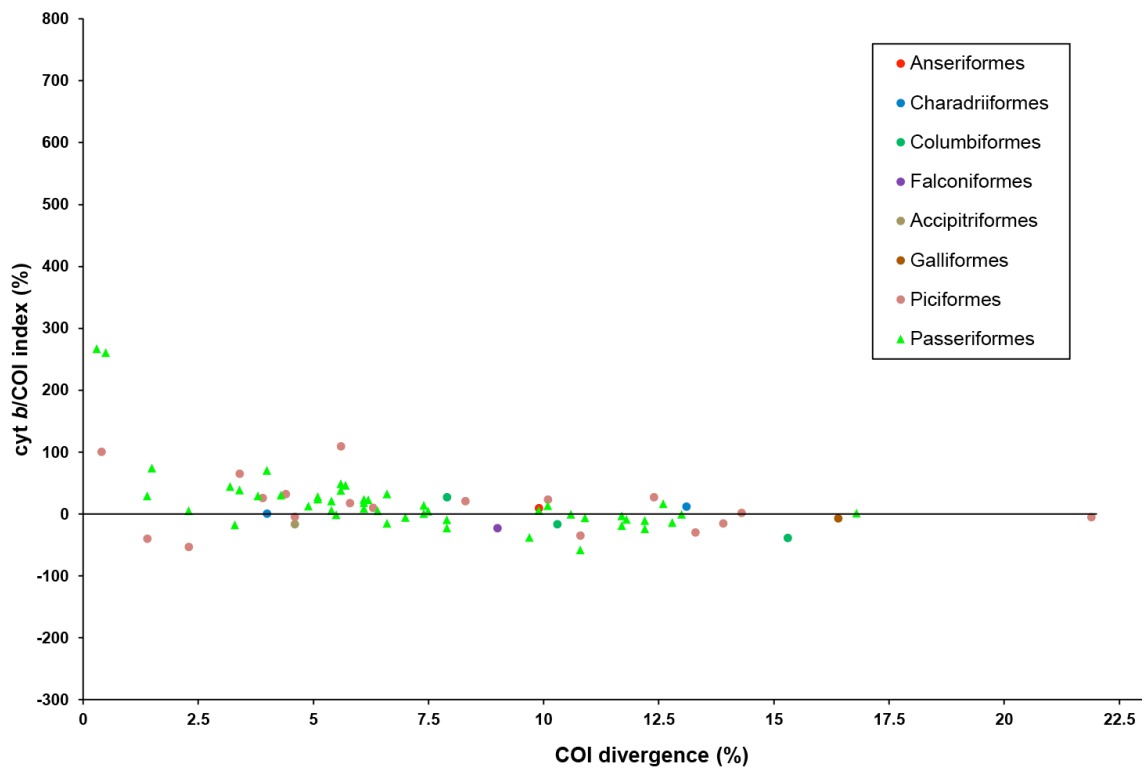


Figure A9. Association between the mean difference in model-corrected divergence between *cyt b* and COI (*cyt b*/COI index) and the mean COI model-corrected genetic distance for eight avian orders from the Paired Gene Dataset. Pearson correlation coefficient ($r = -0.60$, $p < 0.001$). The correlation was performed after weighting the mean index values of each order by the number of pairs of species compared within each of them. Positive index values indicate higher divergence in *cyt b* than in COI.

