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Proc. R. Soc. B 2014 **281**, 20132780, published 29 January 2014

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Cite this article: Wright NA, Gregory TR, Witt CC. 2014 Metabolic 'engines' of flight drive genome size reduction in birds. *Proc. R. Soc. B* **281**: 20132780.
<http://dx.doi.org/10.1098/rspb.2013.2780>

Received: 24 October 2013

Accepted: 6 January 2014

Subject Areas:

physiology, genomics, evolution

Keywords:

C-value, genome size, flight, heart index, flight muscles

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Electronic supplementary material is available at <http://dx.doi.org/10.1098/rspb.2013.2780> or via <http://rspb.royalsocietypublishing.org>.

Metabolic 'engines' of flight drive genome size reduction in birds

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The tendency for flying organisms to possess small genomes has been interpreted as evidence of natural selection acting on the physical size of the genome. Nonetheless, the flight–genome link and its mechanistic basis have yet to be well established by comparative studies within a volant clade. Is there a particular functional aspect of flight such as brisk metabolism, lift production or maneuverability that impinges on the physical genome? We measured genome sizes, wing dimensions and heart, flight muscle and body masses from a phylogenetically diverse set of bird species. In phylogenetically controlled analyses, we found that genome size was negatively correlated with relative flight muscle size and heart index (i.e. ratio of heart to body mass), but positively correlated with body mass and wing loading. The proportional masses of the flight muscles and heart were the most important parameters explaining variation in genome size in multivariate models. Hence, the metabolic intensity of powered flight appears to have driven genome size reduction in birds.

1. Introduction

(a) Genome size evolution

The causes and consequences of variability in nuclear genome size have been a subject of research and discussion for many decades [1,2], but much remains to be learned. Several intriguing comparative patterns have been identified that provide insights into the evolutionary forces that have shaped genome size diversity. As a notable example, a proposed link between powered flight and reduced genome sizes in bats, birds and pterosaurs has been interpreted as evidence that the metabolic demands of flight exerted selective pressures for small cells with reduced DNA content [3–5]. These three historical instances of flight origins and genome constriction are suggestive, but comprise meagre statistical evidence for a mechanistic link. Furthermore, ancestral state estimates for the archosaur phylogeny revealed that much of the genome size reduction in the ancestors of modern birds predated the origin of flight [6].

If flight ability imposes strong evolutionary constraints on genome size, then interspecific diversity in flight ability should explain at least some of the variability in genome size within volant clades. Indeed, evidence to this effect has begun to accumulate, with some caveats. Hughes & Hughes [3] found that flightless birds have larger genomes than volant relatives, but this pattern became non-significant after accounting for phylogenetic inertia [4]. Hovering hummingbirds exhibit the highest mass-specific metabolic rates among vertebrates [7], and a large sample of hummingbird species was found to have uniformly small genomes and to include the smallest amniote genome measured to date [8]. In 74 species of temperate, migratory passerine birds, genome size was positively associated with wing-loading index, indicating that species that have evolved larger wings for flight efficiency have also evolved smaller genomes [9]. Additional components of flight performance beyond wing size and shape have yet to be investigated for potential effects on genome size.

The metabolic rate hypothesis is the leading explanation for reduced genomes in volant organisms [3]. According to this hypothesis, the size of the genome imposes a minimum size constraint on nucleated cells, and the higher proportional

surface areas of smaller cells make them conducive to higher metabolic flux [10]. The energy required to produce lift and thrust requires sustained high metabolic output [11], resulting in indirect selection for smaller genomes to reduce the size of nucleated cells [10]. In keeping with this hypothesis, genome size and red blood cell size are negatively correlated with resting metabolic rate across vertebrates and within vertebrate classes, including birds [12]. Aside from the putative metabolic rate effect, a reduction in cellular DNA content and a concomitant decrease in cell size might allow flying organisms to achieve a reduction in body mass [12] and may even enhance efficiency of neural function associated with maneuverability [12,13]. Under the latter mechanisms, wing loading and wing shape would be predicted to correlate strongly with genome size.

(b) The avian flight 'engines'

The pectoral and cardiac muscles are the metabolic 'engines' of avian flight, and therefore might illuminate the causes of genome size evolution. The avian pectoral flight muscles, comprising the pectoralis major and supracoracoideus, provide the power for downstroke and upstroke, respectively. The pectoral flight muscles vary greatly in size across birds, ranging from approximately 5% of the body mass in rails and ground cuckoos to over 30% in some hummingbirds and pigeons [14,15]. The ratio of heart mass to body mass, the heart index [16], indicates the relative allocation of resources for oxidative metabolism. Both maximum cardiac output and aerobic power input scale with heart mass to a power of approximately 0.88 [17,18], and heart mass accurately predicts maximum metabolic rate and aerobic scope [19]. Although the flight muscles and heart generate and supply power for a substantial portion of locomotory and thermogenic activity [20–23], species variation in relative flight muscle size and heart index indicates the degree of importance of burst power [24] and endurance flight performance [17], respectively. Previous studies using non-phylogenetic methods have found that genome size was negatively correlated with heart index in birds ($n = 53$), mammals, non-avian reptiles and amphibians [16].

(c) This study

The link between flight and reduced genome size has received substantial attention [3–5,12,25], but there is not yet a broad comparative analysis of variation in the flight and metabolic structures as they relate to genome size within a volant clade. In this study, we developed the largest internally consistent dataset on bird genome sizes, comprising 18 orders, 76 families and 422 species. Species were selected to represent a diversity of environments, ecological niches and life histories. We sought to elucidate the effects of flight on genome size evolution during the diversification of birds using measurements of three flight-related structures: the heart, the flight muscles and the wings.

2. Material and methods

(a) Data collection

We captured wild birds and drew blood from the brachial vein to prepare blood smear slides. Birds were euthanized, prepared as museum specimens with frozen tissues and deposited at the

Museum of Southwestern Biology (University of New Mexico, USA) and/or Centro de Ornithología y Biodiversidad (Lima, Peru). Slides of blood blotted from the liver were prepared for individuals from which we were unable to draw blood. One investigator (N.A.W.) estimated genome size by Feulgen image analysis densitometry using the protocol of Hardie *et al.* [26], with chicken, *Gallus gallus* (1.25 pg), as the standard, and more than 200 nuclei measured per individual. For species represented by more than one individual, mean within-species standard deviation of genome size estimates was 0.035, whereas the among-species standard deviation in genome size was 0.138. The low intraspecific variation, relative to interspecific variation, suggests that estimates of genome size using only one individual should be sufficiently representative of the species. Genome size estimates are available in the electronic supplementary material, table S1.

We weighed each bird and extracted and weighed whole hearts (after blotting to remove blood) and the pectoralis major and supracoracoideus flight muscles. Relative flight muscle size was calculated by dividing total flight muscle mass by body mass. Heart index was calculated by dividing the heart mass by the body mass [16]. We used proxies for aspect ratio and wing loading that could be measured from museum study skins. The hand-wing index, or Kipp's index [27,28], is equal to the distance between the tip of the longest primary and the tip of the first secondary divided by the wing chord [27]; larger values indicate more pointed wings. This can be calculated as $(WL - SL)/WL$, where WL is the wing chord and SL is the distance from the wrist joint to the tip of the first secondary [27]. This index is correlated with dispersal ability in interspecific comparisons [27,29,30]. WL comprises the lengths of the manus and the longest primary feather, both of which are strongly correlated with overall wing length and scale isometrically with other wing components such as the ulna [31–33]. Bird wings are generally shaped as one-quarter of an oval. Thus, wing area was estimated as the area of an oval divided by four $(WL \times SL \times \pi/4)$. Wing area estimates were used to approximate wing loading (body mass/total wing area).

Species averages for the above morphological measurements were obtained from specimens at the Museum of Southwestern Biology and Florida Museum of Natural History. We were unable to obtain all morphological measurements for all species. Thus, with genome size estimates for 422 species, we analysed two overlapping datasets of species-average values: (i) relative flight muscle size, heart index and body mass for 289 species; and (ii) relative flight muscle size, heart index, body mass, hand-wing index and wing loading for 193 species.

(b) Data analysis

We used a time-calibrated phylogeny based on published DNA sequences for over 6000 species of birds [34] that we trimmed to include only the species in our genome size dataset. We placed the approximately 5% of the species in our dataset that were not represented in this tree following the methods of Sibly *et al.* [35]. We used this tree to calculate phylogenetic independent contrasts, test for phylogenetic signal in the data and perform phylogenetic generalized least-squares (PGLS) models under a Brownian motion model in R v. 2.15.1 [36] using packages ape [37], caper [38] and nlme [39]. We log-transformed body mass prior to analyses. We used Akaike's Information Criterion (AIC) to select the best model(s) for non-phylogenetic linear regression and PGLS. Multi-parameter models were discarded from consideration if a nested model, containing a subset of the same parameters, had a better AIC score [40,41].

We tested for constraints on maximum genome size that might be associated with high flight ability (i.e. high values of relative heart mass, relative flight muscle size and hand-wing index or low values of body mass and wing loading). For each

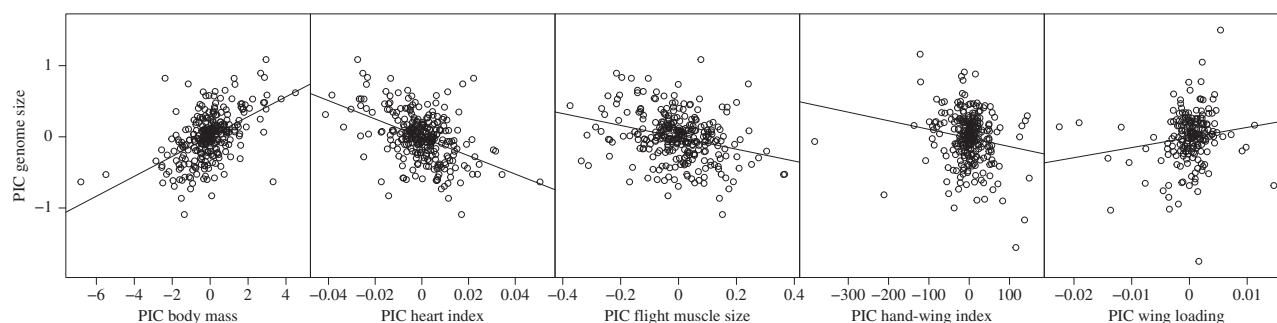


Figure 1. Phylogenetic independent contrasts (PICs) of species mean values for genome size plotted as a function of heart index, relative flight muscle size, body mass, hand-wing index and wing loading.

measure of flight ability, we binned values into 15 equally spaced bins, following Derryberry *et al.* [42]. We selected the species with the maximum genome size value in each bin to include in the upper-bound set. We then tested whether these upper-bound values of genome size decline with increasing flight ability more dramatically than do all other values. To do this, we used ANCOVA to test for the significance of an interaction term between the measure of flight ability and whether a sample was included in the upper-bound set.

3. Results

There was significant phylogenetic inertia in genome size across the entire 422-species dataset. Pagel's lambda was 0.88 (95% CI: 0.788, 0.943), indicating that phylogenetic non-independence should be accounted for in comparative analyses. Blomberg's K , which estimates the amount of phylogenetic signal in the data relative to the amount expected for a trait evolving along the same tree by Brownian motion [43,44], was 0.451 (significantly greater than zero, $p = 0.001$).

Body mass was negatively correlated with heart index (PGLS: d.f. = 286, $p < 0.001$, $R^2 = 0.043$), but not with relative flight muscle size (PGLS: d.f. = 286, $p = 0.13$, $R^2 < 0.01$). Heart mass scaled with body mass to a power of 0.78 in our dataset (95% CI: 0.75, 0.81).

In single variable phylogenetic models, genome size was negatively correlated with heart index and relative flight muscle size and positively correlated with body mass and wing loading (figures 1 and 2; the electronic supplementary material, table S2). In the larger dataset (289 species), the top ranking PGLS models (i.e. those within 95% cumulative AIC weight after excluding models with uninformative parameters) included heart index and relative flight muscle size as significant predictors of genome size (table 1). In the reduced dataset (193 species), the top ranking PGLS models included relative flight muscle size, wing loading, heart index and body mass as important predictors of genome size; wing loading was unique among these variables in that it was not statistically significant ($p < 0.05$) in any of the top models (tables 2 and 3).

We found evidence of constraints on genome size with respect to some measures of flight ability. The slopes of regressions of genome size by heart index and hand-wing index, respectively, were more steeply negative for upper-bound points than for other points (table 4 and figure 2), indicating that large genome sizes were particularly unlikely to occur in species with large hearts or pointed wings.

Visualization of the evolution of genome size across the avian tree revealed lability among families and orders

(figure 3). Orders differed significantly from one another in average genome size (ANOVA: $p < 0.001$, d.f. = 404; figure 3; the electronic supplementary material, table S3), with Apodiformes exhibiting the smallest average genome sizes. Of the orders represented by at least five species, Piciformes had the largest and most variable genomes (figures 2 and 3; the electronic supplementary material, table S3). Passerine genomes were significantly smaller than those of non-passerine orders (t -test: $p = 0.006$; d.f. = 180; 95% CI of mean difference: (-0.08, -0.013)). Deep phylogenetic structure in genome size was evident among major clades of passerines. Nine-primaried oscines had larger genomes, on average, than other passerines (t -test: $p < 0.001$; d.f. = 128; 95% CI of mean difference: (0.019, 0.071)). However, extreme values were not necessarily consistent with these broader patterns. For example, out of all passerine families, the smallest average genome sizes were found in two oscine families, the vangas (Dicuridae; C -value 1.13 pg) and the indigobirds and whydahs (Viduidae; C -value 1.14 pg); and the largest passerine genome was not found in a nine-primaried oscine, but rather the phainopepla (*Phainopepla nitens*; C -value 1.83 pg).

4. Discussion

(a) Which aspects of flight are related to genome size?

Flight muscle size, heart size, body size, wing aspect ratio and wing loading reveal different aspects of flight ability in birds. Each of these parameters, with the exception of wing aspect ratio, is individually correlated with genome size across a wide swath of the avian tree (figures 1 and 2; the electronic supplementary material, table S2), strongly supporting the idea that small genomes and overall flight ability are linked. In multivariate models, flight muscle size, heart size, body size and wing loading explain unique fractions of genome size variation, with flight muscle size and heart size being the most consistently important predictors of genome size. There was no indication that wing aspect ratio (measured by hand-wing index) explains any additional variation. These findings are consistent with the hypothesis that the cellular metabolic rate during flight, rather than constraints on aerial maneuverability or lift, was the main cause of genome size reduction in birds.

Relative flight muscle size was the single best predictor of genome size: it was significant in almost all top models in both the 289- and 193-species datasets (tables 1–3). Flight muscles provide the power for flapping flight, and as such are most important in strong take-offs and bursts of speed in flight, where power requirements are highest [24]. Thus, large flight muscles are expected to indicate an evolutionary

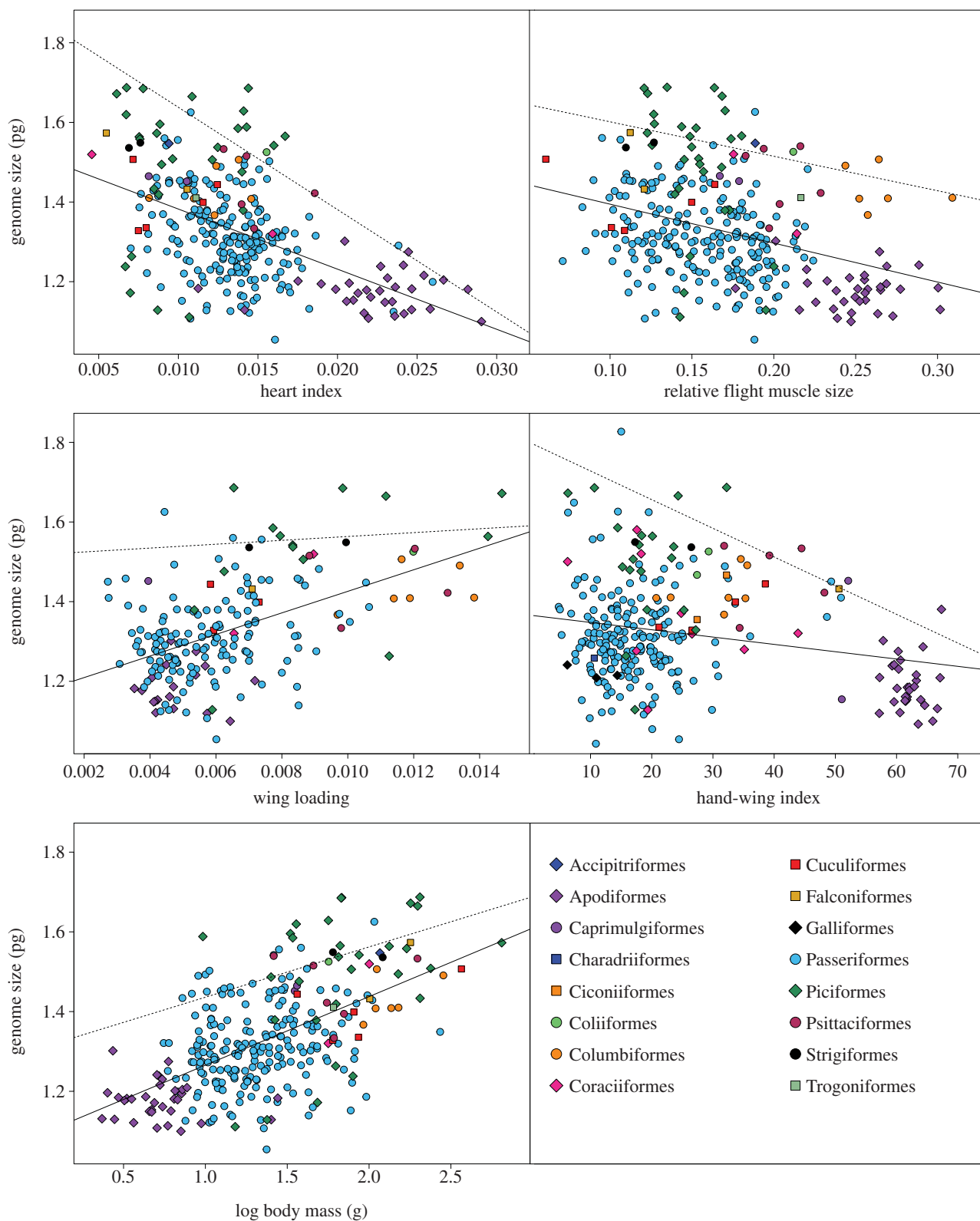


Figure 2. Species mean values for genome size plotted as a function of heart index, relative flight muscle size, wing loading, hand-wing index and body mass, colour-coded by order. Solid lines are all-points regression lines; dashed lines are upper bound regression lines.

Table 1. Models predicting genome size within 95% cumulative AIC weight after excluding models with uninformative parameters for the 289-species dataset (f, relative flight muscle size; h, heart index; m, body mass). PGLS, phylogenetic generalized linear model; regression, conventional (non-phylogenetically corrected) linear regression.

model type	model	adj. R^2	d.f.	p -values	AIC	AIC weight
PGLS	f + h	0.073	286	f: 0.0038; h: 0.0043	-557.31	0.91
PGLS	h	0.049	287	h < 0.001	-522.19	0.07
regression	f + m	0.38	286	f < 0.001; m < 0.001	-486.49	0.999

Table 2. Models predicting genome size within 95% cumulative AIC weight after excluding models with uninformative parameters for the reduced dataset ($N = 193$ species; f, relative flight muscle size; h, heart index; wl, wing loading; hw, hand-wing index; m, mass). PGLS, phylogenetic generalized linear model; regression, conventional (non-phylogenetically corrected) linear regression.

model type	model	adj. R^2	d.f.	p -values	AIC	AIC weight
PGLS	f + h + m + wl	0.12	188	f < 0.001; h: 0.49; m: 0.006; wl: 0.26	-369.18	0.46
PGLS	f + h + wl	0.088	189	f: 0.005; h: 0.057; wl: 0.40	-368.03	0.26
PGLS	f + m + wl	0.12	189	f < 0.001; m: 0.001; wl: 0.26	-366.75	0.13
PGLS	f + h + m	0.119	189	f < 0.001; h: 0.49; m: 0.007	-364.52	0.04
PGLS	f + h	0.09	190	f: 0.006; h: 0.019	-364.41	0.04
PGLS	h + wl	0.054	190	h: 0.001; wl: 0.66	-363.06	0.02
regression	f + m + hw + wl	0.41	188	f < 0.001; m < 0.001; hw: 0.041; wl: 0.063	-346.44	0.52
regression	f + m + hw	0.40	189	f < 0.001; m < 0.001; hw: 0.033	-344.88	0.24
regression	f + m + wl	0.40	189	f < 0.001; m < 0.001; wl: 0.051	-344.14	0.17
regression	f + m	0.39	190	f: 0.002; m < 0.001	-342.24	0.06

Table 3. Cumulative model weights for each predictor variable in the five-parameter ($N = 193$ species) and three-parameter ($N = 289$ species) datasets, calculated by summing Akaike model weights for all models that included the variable of interest, following Arnold [40]. PGLS, phylogenetic generalized linear model; regression, conventional (non-phylogenetically corrected) linear regression.

	five-parameter ($N = 193$)		three-parameter ($N = 289$)	
	PGLS	regression	PGLS	regression
relative flight muscle size	0.966	0.996	0.93	0.999
wing loading	0.894	0.691	n.a.	n.a.
heart index	0.834	0.302	0.99	0.27
body mass	0.657	0.999	0.06	0.999
hand-wing index	0.002	0.742	n.a.	n.a.

Table 4. Comparison of upper bound regressions to standard linear regressions for genome size by each flight ability predictor variable. We used an ANCOVA with an interaction term between the predictor variable and whether a sample was included in the upper-bound set.

predictor variable	95% CI for upper bound slope	95% CI for all points slope	two-tailed p -value for upper bound interaction
heart index	(-32.3, -19.1)	(-18.1, -12.1)	$p = 0.018$
relative flight muscle size	(-1.78, -0.07)	(-1.33, -0.70)	$p = 0.78$
body mass	(0.04, 0.21)	(0.15, 0.20)	$p = 0.24$
hand-wing index	(-0.0095, -0.0049)	(-0.0028, -0.00090)	$p = 0.003$
wing loading	(-10.26, 19.96)	(20.42, 33.71)	$p = 0.86$

response to selection for rapid take-off ability or powered acceleration during flapping flight. Additionally, the size of the flight muscles is a primary determinant of exercise-induced maximum metabolic rate or thermogenic capacity in intraspecific comparisons for at least five species of birds that have been tested, representing three orders and a wide range of body sizes [20–23,46].

Heart index was an important and statistically significant predictor of genome size in top PGLS models (tables 1–3). The size of the heart constrains its stroke volume and, as a

result, limits maximum cardiac output, aerobic power, exercise-induced maximum metabolic rate and aerobic scope [17–19]. Routine powered flight incurs a 10- to 20-fold sustained increase in metabolic rate [11]. Therefore, heart index in birds should closely reflect aerobic power requirements for sustained flight.

Body mass generally shows strong phylogenetic signal [43] and correspondingly was present and significant in all top ranking non-phylogenetic models, but not all PGLS ones (tables 1–3). Either body mass or heart index was

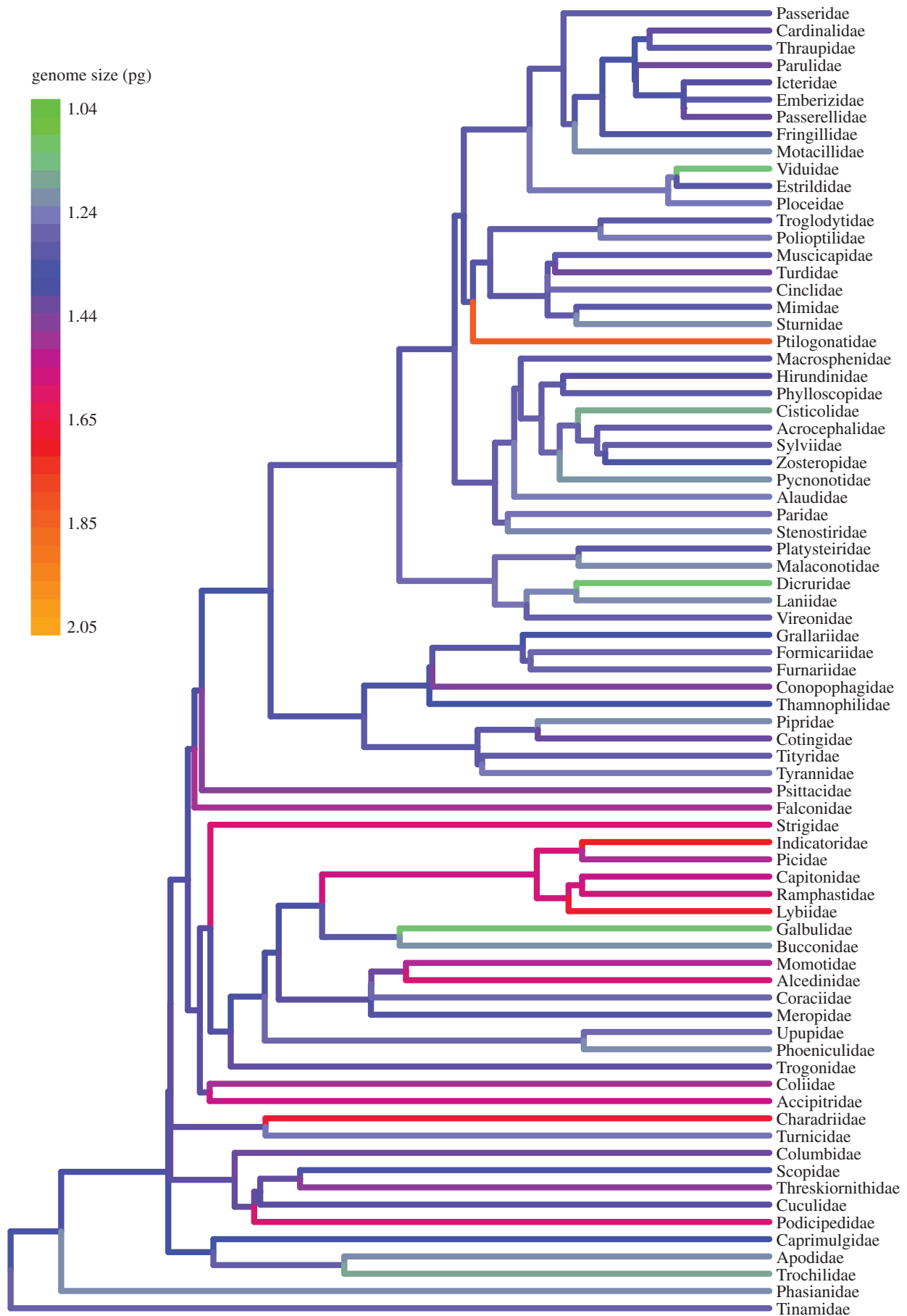


Figure 3. Family-level phylogeny with terminal branches colour-coded by the average genome size for each family. Internal branches are colour-coded by the estimated ancestral genome size, using maximum-likelihood ancestral character state estimation in the R package *ape* [37]. The tree is from Jetz *et al.* [45] and was downloaded from www.birdtree.org with data preference set to 'Hackett all species'.

significant (or nearly so) in every top ranking model, but in no model were both parameters significant (tables 1 and 2). Heart mass scales with body mass to a power of 0.78 in our dataset, very close to the three-quarter power scaling of metabolic rate [47]. Heart size may be a more precise predictor of metabolic rate than body mass because it is more directly, mechanistically connected to metabolism than is body mass, in part because it scales isometrically with cardiac stroke volume [18,48]. Indeed, heart mass has been shown to explain variation in exercise-induced maximum metabolic rate after accounting for the effects of body mass [19]. Consistent with this, for our largest dataset, AIC decisively indicated that heart index was the best single predictor of genome size and that body mass did not explain residual variation after heart index was included in the model (table 1).

Hand-wing index did not appear in top ranking PGLS models (tables 2 and 3). The link between genome size and hand-wing index in conventional regression (figure 2 and table 3; the electronic supplementary material, table S2) appears to have been driven by phylogenetic inertia, specifically the confluence of extreme values in the hummingbirds and swifts (Apodiformes). Accordingly, the effect of hand-wing index disappears when covariance due to phylogeny is taken into account. Long, pointed wings improve high-speed flight performance by reducing drag, especially at higher speeds [49]. High aspect ratio is typical of bird species that are long-distance migrants or aerial foragers [50,51]. However, some birds with high aspect ratios engage in flight styles with low energetic demand (e.g. dynamic soarers) and accordingly would not achieve the metabolic intensity associated with flapping flight.

Wing loading was included as an important predictor variable in several top PGLS models, but was never a significant variable in these models ($p > 0.25$; tables 2 and 3). Birds with low wing loading are able to produce lift with low metabolic energy input [52]. The tendency for aerial specialists to have low wing loading is thought to be the basis for the previous finding that passerines with low wing loading tend to have small genomes [13]. However, wing loading reflects a balance of ecological and biomechanical pressures and many strong, energetic flyers have high wing loading (e.g. pigeons, doves and many ducks [52]). Thus, wing loading, like aspect ratio, is at least partly decoupled from flight metabolism and is unlikely to explain genome size variation if the maximum sustained rate of cellular metabolism is the key driver of genome size reduction.

(b) The importance of accounting for phylogenetic inertia

Genome size exhibited phylogenetic signal across the avian tree, as indicated by Pagel's lambda and Blomberg's K -values that were significantly greater than zero. Related taxa were less similar in genome size than expected under a model of evolution by Brownian motion, as indicated by the Blomberg's K -value being less than one [43,44]. This apparent lability is more typical of behavioural traits than constrained life-history traits such as body mass [43] and it suggests that divergent selection has acted on genome size, although measurement error is also expected to contribute to this effect. Nonetheless, as a result of the pervasive phylogenetic inertia in genome size, the PGLS analyses are expected to be more informative regarding potential mechanisms in cases where they differ from non-phylogenetically

controlled analyses [53]. Hence, in the 289-species analysis, the inclusion of body mass and exclusion of heart index in the top ranking non-phylogenetic model are likely examples of type I and type II errors, respectively (table 1).

(c) Constraints on genome size associated with extreme flight ability

Genome size appears to be constrained with respect to heart index and hand-wing index, as indicated by the different slope of the regression for upper bound points (figure 2 and table 4). Species with small hearts or rounded wings may have either large or small genomes, but strong flyers with large hearts or pointed wings appear to be constrained to have small genomes. This pattern suggests that genome size evolves neutrally in poor flyers, but that large genomes impose a fitness cost on birds that experience high metabolic intensity during flight.

(d) Genome size variation across the tree of birds

The hummingbirds have exceptionally small genomes with low variation in genome size [8]. This study is the first to show that the nearest relatives of hummingbirds, the swifts (Apodidae), also have small genomes (figure 3 and the electronic supplementary material, table S3). Like many other traits of hummingbirds that are thought to be adaptive for metabolically intensive flight (e.g. high aspect ratio, reduced hindlimbs, large pectoral flight muscles), reduced genome size probably evolved in the common ancestor of hummingbirds and swifts (figure 3).

The Pici clade, comprising the woodpeckers, honeyguides, barbets and toucans, exhibits exceptionally large genomes, whereas members of its sister taxon, the Galbulae (Galbulidae and Bucconidae), have fairly small genomes (figure 3 and the electronic supplementary material, table S3). Members of the clade including Piciformes and Coraciiformes are anomalously variable, with sister lineages sometimes differing substantially in genome size (figure 3 and the electronic supplementary material, tables S1 and S2). For example, the two honeyguide species included in this study, both in the genus *Indicator*, exhibit strikingly different genome sizes (1.38 versus 2.05 pg; the electronic supplementary material, table S1). Han *et al.* [54] found large numbers of transposable elements in the Piciformes–Coraciiformes clade, which may contribute to the large average genome sizes and the high degree of variation observed in the group [4,55]. The macromutations that may have caused fluctuations in genome size among Piciformes deserve investigation by comparison of genome sequences. To this end, frozen tissues are archived for all of our voucher specimens (see electronic supplementary material, table S1).

5. Conclusion

The long-recognized link between flight and small genome size has been decisively confirmed using interspecific comparisons within the most diverse volant group. Four flight-related characteristics show that the evolution of enhanced flight ability tends to be accompanied by genome size reduction. In comparisons among phylogenetically corrected models, the best predictors of genome size proved to be the sizes of the flight muscles and heart, rather than the size or shape of the wings. The avian flight muscles generate cellular metabolic energy in

proportion to their enormous bulk (5–30% of total body mass), providing the majority of power output for aerial locomotion and thermogenesis. Cardiac output constrains the power input for cellular metabolism and is in turn limited by heart size. Consistent with the metabolic rate hypothesis, these two components of the metabolic flight ‘engine’ implicate the rate of energy use as a key driver of repeated evolutionary reductions in avian genome size.

Acknowledgements. We thank N. Jeffery for assistance in the laboratory, C. E. Gunning for help with R code and J. Hammond for statistics advice. This study was made possible by data, specimens and curatorial staff from the Museum of Southwestern Biology, the Field Museum of Natural History, and the Florida Museum of Natural History. We thank the individuals who collected key samples: J. M. Bates, E. Bautista, E. J. Beckman, P. M. Benham, S. V. Brant, D. DeSwardt, R. W. Dickerman, S. G. DuBay, S. C. Galen, E. Gendron, S. J. Hackett, A. B. Johnson, M. R. Jones, B. D. Marks, R. Nuttall, C. J. Schmitt, D. C. Schmitt, C. G. Schmitt, A. Smiley, E. W. Valdez, T. Valqui, W. Vargas, J. D. Weckstein and D. E. Willard. B. O. Wolf, J. H. Brown and two anonymous reviewers

provided valuable feedback on the manuscript. This work was conducted under UNM IACUC protocol number 11-100742-mcc. We thank the management authorities of Peru (135-2009-AG-DGFFS-DGEFFS, 0377-2010-AG-DGFFS-DGEFFS, 0199-2012-AG-DGFFS-DGEFFS) and Free State, South Africa (01/8233, 01/12248).

Data accessibility. Genome size estimates are available in Table S1 and on the Animal Genome Size Database (<http://www.genomesize.com/>). Table S1 includes museum accession numbers for each specimen used in this study. Specimen data are archived in museum databases (<http://arctos.database.museum/SpecimenSearch.cfm>).

Funding statement. We acknowledge NSF DEB-1146491, the Center for Evolutionary and Theoretical Immunology and R. W. Dickerman for funding support. N.A.W. is supported by the Program in Interdisciplinary Biomedical and Biological Sciences through the University of New Mexico award number T32EB009414 from the National Institute of Biomedical Imaging and Bioengineering. T.R.G. is supported by a Discovery Grant from the Natural Sciences and Engineering Research Council of Canada. The content is the sole responsibility of the authors and does not necessarily represent the official views of the National Institute of Biomedical Imaging and Bioengineering or the National Institutes of Health.

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Supplemental Materials

Table S1: Genome size estimates, museum catalog number, taxonomic information, and database link for each specimen included in this study, sorted alphabetically by order, family, and species. Taxonomy follows [1, 2] with selected updates [3, 4].

Order	Family	Species	Catalog number	C-value	Weblink
Accipitriformes	Accipitridae	<i>Accipiter striatus</i>	MSB:Bird:36209	1.547	http://arctos.database.museum/guid/MSB:Bird:36209
Apodiformes	Apodidae	<i>Apus affinis</i>	MSB:Bird:30311	1.380	http://arctos.database.museum/guid/MSB:Bird:30311
Apodiformes	Apodidae	<i>Apus caffer</i>	MSB:Bird:30343	1.269	http://arctos.database.museum/guid/MSB:Bird:30343
Apodiformes	Apodidae	<i>Apus caffer</i>	MSB:Bird:30344	1.163	http://arctos.database.museum/guid/MSB:Bird:30344
Apodiformes	Apodidae	<i>Apus caffer</i>	MSB:Bird:30345	1.175	http://arctos.database.museum/guid/MSB:Bird:30345
Apodiformes	Apodidae	<i>Apus caffer</i>	MSB:Bird:30346	1.125	http://arctos.database.museum/guid/MSB:Bird:30346
Apodiformes	Apodidae	<i>Chaetura egregia</i>	MSB:Bird:37281	1.167	http://arctos.database.museum/guid/MSB:Bird:37281
Apodiformes	Apodidae	<i>Chaetura egregia</i>	MSB:Bird:37282	1.090	http://arctos.database.museum/guid/MSB:Bird:37282
Apodiformes	Apodidae	<i>Chaetura vauxi</i>	MSB:Bird:29000	1.209	http://arctos.database.museum/guid/MSB:Bird:29000
Apodiformes	Trochilidae	<i>Aglaeactis castelnaudii</i>	MSB:Bird:33102	1.157	http://arctos.database.museum/guid/MSB:Bird:33102
Apodiformes	Trochilidae	<i>Aglaeactis castelnaudii</i>	MSB:Bird:34188	1.205	http://arctos.database.museum/guid/MSB:Bird:34188
Apodiformes	Trochilidae	<i>Aglaeactis cupripennis</i>	MSB:Bird:35196	1.207	http://arctos.database.museum/guid/MSB:Bird:35196
Apodiformes	Trochilidae	<i>Aglaeactis cupripennis</i>	MSB:Bird:35324	1.198	http://arctos.database.museum/guid/MSB:Bird:35324
Apodiformes	Trochilidae	<i>Aglaeactis cupripennis</i>	MSB:Bird:36032	1.205	http://arctos.database.museum/guid/MSB:Bird:36032
Apodiformes	Trochilidae	<i>Aglaeactis cupripennis</i>	MSB:Bird:36043	1.167	http://arctos.database.museum/guid/MSB:Bird:36043
Apodiformes	Trochilidae	<i>Agelaiocercus kingi</i>	MSB:Bird:34568	1.153	http://arctos.database.museum/guid/MSB:Bird:34568
Apodiformes	Trochilidae	<i>Amazilia chionogaster</i>	MSB:Bird:33268	1.252	http://arctos.database.museum/guid/MSB:Bird:33268
Apodiformes	Trochilidae	<i>Amazilia chionogaster</i>	MSB:Bird:35759	1.279	http://arctos.database.museum/guid/MSB:Bird:35759
Apodiformes	Trochilidae	<i>Amazilia chionogaster</i>	MSB:Bird:35760	1.216	http://arctos.database.museum/guid/MSB:Bird:35760
Apodiformes	Trochilidae	<i>Amazilia chionogaster</i>	MSB:Bird:35774	1.207	http://arctos.database.museum/guid/MSB:Bird:35774
Apodiformes	Trochilidae	<i>Amazilia viridicauda</i>	MSB:Bird:33259	1.268	http://arctos.database.museum/guid/MSB:Bird:33259
Apodiformes	Trochilidae	<i>Amazilia viridicauda</i>	MSB:Bird:33261	1.211	http://arctos.database.museum/guid/MSB:Bird:33261
Apodiformes	Trochilidae	<i>Amazilia viridicauda</i>	MSB:Bird:33270	1.270	http://arctos.database.museum/guid/MSB:Bird:33270
Apodiformes	Trochilidae	<i>Amazilia viridicauda</i>	MSB:Bird:33274	1.262	http://arctos.database.museum/guid/MSB:Bird:33274
Apodiformes	Trochilidae	<i>Anthracothorax nigricollis</i>	MSB:Bird:37302	1.100	http://arctos.database.museum/guid/MSB:Bird:37302
Apodiformes	Trochilidae	<i>Archilochus alexandri</i>	MSB:Bird:29601	1.184	http://arctos.database.museum/guid/MSB:Bird:29601

Apodiformes	Trochilidae	<i>Calypte anna</i>	MSB:Bird:29207	1.139	http://arctos.database.museum/guid/MSB:Bird:29207
Apodiformes	Trochilidae	<i>Campylopterus villaviscensio</i>	MSB:Bird:36129	1.179	http://arctos.database.museum/guid/MSB:Bird:36129
Apodiformes	Trochilidae	<i>Chalcostigma ruficeps</i>	MSB:Bird:34369	1.182	http://arctos.database.museum/guid/MSB:Bird:34369
Apodiformes	Trochilidae	<i>Chalcostigma stanleyi</i>	MSB:Bird:33032	1.202	http://arctos.database.museum/guid/MSB:Bird:33032
Apodiformes	Trochilidae	<i>Chalcostigma stanleyi</i>	MSB:Bird:33049	1.224	http://arctos.database.museum/guid/MSB:Bird:33049
Apodiformes	Trochilidae	<i>Coeligena torquata</i>	MSB:Bird:31911	1.204	http://arctos.database.museum/guid/MSB:Bird:31911
Apodiformes	Trochilidae	<i>Coeligena violifer</i>	MSB:Bird:34661	1.209	http://arctos.database.museum/guid/MSB:Bird:34661
Apodiformes	Trochilidae	<i>Colibri thalassinus</i>	MSB:Bird:32514	1.160	http://arctos.database.museum/guid/MSB:Bird:32514
Apodiformes	Trochilidae	<i>Colibri thalassinus</i>	MSB:Bird:32702	1.140	http://arctos.database.museum/guid/MSB:Bird:32702
Apodiformes	Trochilidae	<i>Doryfera ludovicae</i>	MSB:Bird:36885	1.275	http://arctos.database.museum/guid/MSB:Bird:36885
Apodiformes	Trochilidae	<i>Ensifera ensifera</i>	MSB:Bird:33938	1.161	http://arctos.database.museum/guid/MSB:Bird:33938
Apodiformes	Trochilidae	<i>Eriocnemis luciani</i>	MSB:Bird:33955	1.221	http://arctos.database.museum/guid/MSB:Bird:33955
Apodiformes	Trochilidae	<i>Eriocnemis luciani</i>	MSB:Bird:33997	1.201	http://arctos.database.museum/guid/MSB:Bird:33997
Apodiformes	Trochilidae	<i>Eutoxeres condamini</i>	MSB:Bird:36761	1.122	http://arctos.database.museum/guid/MSB:Bird:36761
Apodiformes	Trochilidae	<i>Eutoxeres condamini</i>	MSB:Bird:36765	1.117	http://arctos.database.museum/guid/MSB:Bird:36765
Apodiformes	Trochilidae	<i>Haplophaedia aureliae</i>	MSB:Bird:36728	1.108	http://arctos.database.museum/guid/MSB:Bird:36728
Apodiformes	Trochilidae	<i>Helianthus viola</i>	MSB:Bird:35135	1.128	http://arctos.database.museum/guid/MSB:Bird:35135
Apodiformes	Trochilidae	<i>Helianthus viola</i>	MSB:Bird:35175	1.175	http://arctos.database.museum/guid/MSB:Bird:35175
Apodiformes	Trochilidae	<i>Helianthus viola</i>	MSB:Bird:35180	1.180	http://arctos.database.museum/guid/MSB:Bird:35180
Apodiformes	Trochilidae	<i>Heliodoxa aurescens</i>	MSB:Bird:36498	1.045	http://arctos.database.museum/guid/MSB:Bird:36498
Apodiformes	Trochilidae	<i>Heliodoxa aurescens</i>	MSB:Bird:36686	1.129	http://arctos.database.museum/guid/MSB:Bird:36686
Apodiformes	Trochilidae	<i>Heliodoxa aurescens</i>	MSB:Bird:36727	1.118	http://arctos.database.museum/guid/MSB:Bird:36727
Apodiformes	Trochilidae	<i>Heliodoxa aurescens</i>	MSB:Bird:36855	1.162	http://arctos.database.museum/guid/MSB:Bird:36855
Apodiformes	Trochilidae	<i>Heliodoxa rubinoides</i>	MSB:Bird:32494	1.171	http://arctos.database.museum/guid/MSB:Bird:32494
Apodiformes	Trochilidae	<i>Heliodoxa rubinoides</i>	MSB:Bird:32542	1.200	http://arctos.database.museum/guid/MSB:Bird:32542
Apodiformes	Trochilidae	<i>Heliomaster longirostris</i>	MSB:Bird:36912	1.243	http://arctos.database.museum/guid/MSB:Bird:36912
Apodiformes	Trochilidae	<i>Heliomaster longirostris</i>	MSB:Bird:37073	1.160	http://arctos.database.museum/guid/MSB:Bird:37073
Apodiformes	Trochilidae	<i>Hylocharis cyanus</i>	MSB:Bird:37112	1.175	http://arctos.database.museum/guid/MSB:Bird:37112
Apodiformes	Trochilidae	<i>Klais guimeti</i>	MSB:Bird:36149	1.165	http://arctos.database.museum/guid/MSB:Bird:36149
Apodiformes	Trochilidae	<i>Klais guimeti</i>	MSB:Bird:36635	1.125	http://arctos.database.museum/guid/MSB:Bird:36635
Apodiformes	Trochilidae	<i>Klais guimeti</i>	MSB:Bird:36672	1.123	http://arctos.database.museum/guid/MSB:Bird:36672

Apodiformes	Trochilidae	<i>Klais guimeti</i>	MSB:Bird:36861	1.105	http://arctos.database.museum/guid/MSB:Bird:36861
Apodiformes	Trochilidae	<i>Lafresnaya lafresnayi</i>	MSB:Bird:35223	1.200	http://arctos.database.museum/guid/MSB:Bird:35223
Apodiformes	Trochilidae	<i>Lafresnaya lafresnayi</i>	MSB:Bird:35333	1.283	http://arctos.database.museum/guid/MSB:Bird:35333
Apodiformes	Trochilidae	<i>Lesbia nuna</i>	MSB:Bird:35188	1.177	http://arctos.database.museum/guid/MSB:Bird:35188
Apodiformes	Trochilidae	<i>Lesbia victoriae</i>	MSB:Bird:36028	1.121	http://arctos.database.museum/guid/MSB:Bird:36028
Apodiformes	Trochilidae	<i>Leucippus taczanowskii</i>	MSB:Bird:34065	1.224	http://arctos.database.museum/guid/MSB:Bird:34065
Apodiformes	Trochilidae	<i>Leucippus taczanowskii</i>	MSB:Bird:34066	1.237	http://arctos.database.museum/guid/MSB:Bird:34066
Apodiformes	Trochilidae	<i>Metallura tyrianthina</i>	MSB:Bird:36046	1.181	http://arctos.database.museum/guid/MSB:Bird:36046
Apodiformes	Trochilidae	<i>Myrmia micrura</i>	MSB:Bird:33799	1.286	http://arctos.database.museum/guid/MSB:Bird:33799
Apodiformes	Trochilidae	<i>Myrtis fanny</i>	MSB:Bird:34915	1.302	http://arctos.database.museum/guid/MSB:Bird:34915
Apodiformes	Trochilidae	<i>Phaethornis guy</i>	MSB:Bird:36598	1.219	http://arctos.database.museum/guid/MSB:Bird:36598
Apodiformes	Trochilidae	<i>Phaethornis guy</i>	MSB:Bird:36752	1.212	http://arctos.database.museum/guid/MSB:Bird:36752
Apodiformes	Trochilidae	<i>Phaethornis philippii</i>	MSB:Bird:36901	1.176	http://arctos.database.museum/guid/MSB:Bird:36901
Apodiformes	Trochilidae	<i>Phaethornis philippii</i>	MSB:Bird:36981	1.210	http://arctos.database.museum/guid/MSB:Bird:36981
Apodiformes	Trochilidae	<i>Phaethornis philippii</i>	MSB:Bird:37001	1.127	http://arctos.database.museum/guid/MSB:Bird:37001
Apodiformes	Trochilidae	<i>Phaethornis ruber</i>	MSB:Bird:36977	1.131	http://arctos.database.museum/guid/MSB:Bird:36977
Apodiformes	Trochilidae	<i>Phaethornis stuarti</i>	MSB:Bird:36687	1.167	http://arctos.database.museum/guid/MSB:Bird:36687
Apodiformes	Trochilidae	<i>Phaethornis stuarti</i>	MSB:Bird:36848	1.159	http://arctos.database.museum/guid/MSB:Bird:36848
Apodiformes	Trochilidae	<i>Phlogophilus harterti</i>	MSB:Bird:36628	1.196	http://arctos.database.museum/guid/MSB:Bird:36628
Apodiformes	Trochilidae	<i>Polyonymus caroli</i>	MSB:Bird:35990	1.148	http://arctos.database.museum/guid/MSB:Bird:35990
Apodiformes	Trochilidae	<i>Rhodopis vesper</i>	MSB:Bird:35436	1.187	http://arctos.database.museum/guid/MSB:Bird:35436
Apodiformes	Trochilidae	<i>Rhodopis vesper</i>	MSB:Bird:35447	1.185	http://arctos.database.museum/guid/MSB:Bird:35447
Apodiformes	Trochilidae	<i>Selasphorus platycercus</i>	MSB:Bird:26998	1.092	http://arctos.database.museum/guid/MSB:Bird:26998
Apodiformes	Trochilidae	<i>Selasphorus rufus</i>	MSB:Bird:29844	1.151	http://arctos.database.museum/guid/MSB:Bird:29844
Apodiformes	Trochilidae	<i>Taphrospilus hypostictus</i>	MSB:Bird:36867	1.136	http://arctos.database.museum/guid/MSB:Bird:36867
Apodiformes	Trochilidae	<i>Taphrospilus hypostictus</i>	MSB:Bird:36890	1.176	http://arctos.database.museum/guid/MSB:Bird:36890
Apodiformes	Trochilidae	<i>Thaumastura cora</i>	MSB:Bird:32994	1.153	http://arctos.database.museum/guid/MSB:Bird:32994
Apodiformes	Trochilidae	<i>Threnetes leucurus</i>	MSB:Bird:36868	1.151	http://arctos.database.museum/guid/MSB:Bird:36868
Caprimulgiformes	Caprimulgidae	<i>Caprimulgus nigrescens</i>	MSB:Bird:36288	1.395	http://arctos.database.museum/guid/MSB:Bird:36288
Caprimulgiformes	Caprimulgidae	<i>Caprimulgus rufigena</i>	MSB:Bird:30050	1.155	http://arctos.database.museum/guid/MSB:Bird:30050
Caprimulgiformes	Caprimulgidae	<i>Chordeiles acutipennis</i>	MSB:Bird:34228	1.453	http://arctos.database.museum/guid/MSB:Bird:34228
Caprimulgiformes	Caprimulgidae	<i>Chordeiles acutipennis</i>	MSB:Bird:34229	1.451	http://arctos.database.museum/guid/MSB:Bird:34229

Caprimulgiformes	Caprimulgidae	<i>Nyctiphrynus ocellatus</i>	MSB:Bird:36442	1.465	http://arctos.database.museum/guid/MSB:Bird:36442
Charadriiformes	Charadriidae	<i>Vanellus coronatus</i>	MSB:Bird:30396	1.677	http://arctos.database.museum/guid/MSB:Bird:30396
Charadriiformes	Charadriidae	<i>Vanellus coronatus</i>	MSB:Bird:30397	1.663	http://arctos.database.museum/guid/MSB:Bird:30397
Charadriiformes	Turnicidae	<i>Turnix sylvaticus</i>	MSB:Bird:30042	1.258	http://arctos.database.museum/guid/MSB:Bird:30042
Ciconiiformes	Scopidae	<i>Scopus umbretta</i>	MSB:Bird:30380	1.398	http://arctos.database.museum/guid/MSB:Bird:30380
Ciconiiformes	Scopidae	<i>Scopus umbretta</i>	MSB:Bird:30381	1.311	http://arctos.database.museum/guid/MSB:Bird:30381
Ciconiiformes	Threskiornithidae	<i>Bostrychia hagedash</i>	MSB:Bird:30390	1.466	http://arctos.database.museum/guid/MSB:Bird:30390
Coliiformes	Coliidae	<i>Colius colius</i>	MSB:Bird:30054	1.467	http://arctos.database.museum/guid/MSB:Bird:30054
Coliiformes	Coliidae	<i>Urocolius indicus</i>	MSB:Bird:30056	1.562	http://arctos.database.museum/guid/MSB:Bird:30056
Coliiformes	Coliidae	<i>Urocolius indicus</i>	MSB:Bird:30057	1.489	http://arctos.database.museum/guid/MSB:Bird:30057
Columbiformes	Columbidae	<i>Geotrygon montana</i>	MSB:Bird:36764	1.506	http://arctos.database.museum/guid/MSB:Bird:36764
Columbiformes	Columbidae	<i>Leptotila rufaxilla</i>	MSB:Bird:36832	1.410	http://arctos.database.museum/guid/MSB:Bird:36832
Columbiformes	Columbidae	<i>Leptotila verreauxi</i>	MSB:Bird:36605	1.409	http://arctos.database.museum/guid/MSB:Bird:36605
Columbiformes	Columbidae	<i>Patagioenas fasciata</i>	MSB:Bird:35195	1.491	http://arctos.database.museum/guid/MSB:Bird:35195
Columbiformes	Columbidae	<i>Streptopelia capicola</i>	MSB:Bird:30044	1.409	http://arctos.database.museum/guid/MSB:Bird:30044
Columbiformes	Columbidae	<i>Streptopelia senegalensis</i>	MSB:Bird:30045	1.369	http://arctos.database.museum/guid/MSB:Bird:30045
Columbiformes	Columbidae	<i>Streptopelia senegalensis</i>	MSB:Bird:30046	1.365	http://arctos.database.museum/guid/MSB:Bird:30046
Columbiformes	Columbidae	<i>Zenaida auriculata</i>	MSB:Bird:34976	1.408	http://arctos.database.museum/guid/MSB:Bird:34976
Coraciiformes	Alcedinidae	<i>Halcyon albiventris</i>	MSB:Bird:30063	1.580	http://arctos.database.museum/guid/MSB:Bird:30063
Coraciiformes	Coraciidae	<i>Coracias garrulus</i>	MSB:Bird:30064	1.280	http://arctos.database.museum/guid/MSB:Bird:30064
Coraciiformes	Meropidae	<i>Merops apiaster</i>	MSB:Bird:30069	1.320	http://arctos.database.museum/guid/MSB:Bird:30069
Coraciiformes	Meropidae	<i>Merops bullockoides</i>	MSB:Bird:30067	1.335	http://arctos.database.museum/guid/MSB:Bird:30067
Coraciiformes	Meropidae	<i>Merops bullockoides</i>	MSB:Bird:30068	1.406	http://arctos.database.museum/guid/MSB:Bird:30068
Coraciiformes	Momotidae	<i>Baryphthengus martii</i>	MSB:Bird:27757	1.500	http://arctos.database.museum/guid/MSB:Bird:27757
Coraciiformes	Momotidae	<i>Momotus momota</i>	MSB:Bird:37262	1.520	http://arctos.database.museum/guid/MSB:Bird:37262
Coraciiformes	Phoeniculidae	<i>Phoeniculus purpureus</i>	MSB:Bird:30051	1.319	http://arctos.database.museum/guid/MSB:Bird:30051
Coraciiformes	Phoeniculidae	<i>Rhinopomastus cyanomelas</i>	MSB:Bird:30347	1.131	http://arctos.database.museum/guid/MSB:Bird:30347
Coraciiformes	Phoeniculidae	<i>Rhinopomastus cyanomelas</i>	MSB:Bird:30348	1.125	http://arctos.database.museum/guid/MSB:Bird:30348
Coraciiformes	Upupidae	<i>Upupa epops</i>	MSB:Bird:30312	1.276	http://arctos.database.museum/guid/MSB:Bird:30312
Cuculiformes	Cuculidae	<i>Chrysococcyx caprius</i>	MSB:Bird:30316	1.442	http://arctos.database.museum/guid/MSB:Bird:30316
Cuculiformes	Cuculidae	<i>Chrysococcyx caprius</i>	MSB:Bird:30317	1.446	http://arctos.database.museum/guid/MSB:Bird:30317
Cuculiformes	Cuculidae	<i>Clamator jacobinus</i>	MSB:Bird:30321	1.399	http://arctos.database.museum/guid/MSB:Bird:30321

Cuculiformes	Cuculidae	<i>Crotophaga ani</i>	MSB:Bird:36690	1.381	http://arctos.database.museum/guid/MSB:Bird:36690
Cuculiformes	Cuculidae	<i>Crotophaga ani</i>	MSB:Bird:37244	1.291	http://arctos.database.museum/guid/MSB:Bird:37244
Cuculiformes	Cuculidae	<i>Crotophaga sulcirostris</i>	MSB:Bird:33879	1.328	http://arctos.database.museum/guid/MSB:Bird:33879
Cuculiformes	Cuculidae	<i>Neomorphus geoffroyi</i>	MSB:Bird:36662	1.507	http://arctos.database.museum/guid/MSB:Bird:36662
Falconiformes	Falconidae	<i>Falco sparverius</i>	MSB:Bird:35898	1.430	http://arctos.database.museum/guid/MSB:Bird:35898
Falconiformes	Falconidae	<i>Falco sparverius</i>	MSB:Bird:35929	1.434	http://arctos.database.museum/guid/MSB:Bird:35929
Falconiformes	Falconidae	<i>Micrastur ruficollis</i>	MSB:Bird:36769	1.573	http://arctos.database.museum/guid/MSB:Bird:36769
Galliformes	Phasianidae	<i>Francolinus natalensis</i>	MSB:Bird:30384	1.215	http://arctos.database.museum/guid/MSB:Bird:30384
Galliformes	Phasianidae	<i>Francolinus swainsonii</i>	MSB:Bird:30385	1.205	http://arctos.database.museum/guid/MSB:Bird:30385
Galliformes	Phasianidae	<i>Francolinus swainsonii</i>	MSB:Bird:30386	1.212	http://arctos.database.museum/guid/MSB:Bird:30386
Galliformes	Phasianidae	<i>Numida meleagris</i>	MSB:Bird:30382	1.232	http://arctos.database.museum/guid/MSB:Bird:30382
Galliformes	Phasianidae	<i>Numida meleagris</i>	MSB:Bird:30383	1.249	http://arctos.database.museum/guid/MSB:Bird:30383
Passeriformes	Acrocephalidae	<i>Acrocephalus baeticatus</i>	MSB:Bird:30202	1.333	http://arctos.database.museum/guid/MSB:Bird:30202
Passeriformes	Acrocephalidae	<i>Acrocephalus baeticatus</i>	MSB:Bird:30203	1.329	http://arctos.database.museum/guid/MSB:Bird:30203
Passeriformes	Acrocephalidae	<i>Hippolais icterina</i>	MSB:Bird:30199	1.293	http://arctos.database.museum/guid/MSB:Bird:30199
Passeriformes	Acrocephalidae	<i>Hippolais icterina</i>	MSB:Bird:30200	1.282	http://arctos.database.museum/guid/MSB:Bird:30200
Passeriformes	Alaudidae	<i>Calendulauda sabota</i>	MSB:Bird:30367	1.279	http://arctos.database.museum/guid/MSB:Bird:30367
Passeriformes	Alaudidae	<i>Calendulauda sabota</i>	MSB:Bird:30368	1.213	http://arctos.database.museum/guid/MSB:Bird:30368
Passeriformes	Cardinalidae	<i>Cyanocompsa cyanoides</i>	MSB:Bird:37162	1.342	http://arctos.database.museum/guid/MSB:Bird:37162
Passeriformes	Cardinalidae	<i>Pheucticus aureoventris</i>	MSB:Bird:35704	1.511	http://arctos.database.museum/guid/MSB:Bird:35704
Passeriformes	Cardinalidae	<i>Pheucticus aureoventris</i>	MSB:Bird:35705	1.405	http://arctos.database.museum/guid/MSB:Bird:35705
Passeriformes	Cardinalidae	<i>Pheucticus chrysogaster</i>	MSB:Bird:35389	1.454	http://arctos.database.museum/guid/MSB:Bird:35389
Passeriformes	Cinclidae	<i>Cinclus leucocephalus</i>	MSB:Bird:35883	1.275	http://arctos.database.museum/guid/MSB:Bird:35883
Passeriformes	Cisticolidae	<i>Cisticola aridulus</i>	MSB:Bird:30171	1.240	http://arctos.database.museum/guid/MSB:Bird:30171
Passeriformes	Cisticolidae	<i>Cisticola chiniana</i>	MSB:Bird:30177	1.239	http://arctos.database.museum/guid/MSB:Bird:30177
Passeriformes	Cisticolidae	<i>Cisticola chiniana</i>	MSB:Bird:30178	1.217	http://arctos.database.museum/guid/MSB:Bird:30178
Passeriformes	Cisticolidae	<i>Cisticola fulvicapilla</i>	MSB:Bird:30172	1.152	http://arctos.database.museum/guid/MSB:Bird:30172
Passeriformes	Cisticolidae	<i>Cisticola juncidis</i>	MSB:Bird:30181	1.201	http://arctos.database.museum/guid/MSB:Bird:30181
Passeriformes	Cisticolidae	<i>Cisticola juncidis</i>	MSB:Bird:30182	1.127	http://arctos.database.museum/guid/MSB:Bird:30182
Passeriformes	Cisticolidae	<i>Cisticola subruficapilla</i>	MSB:Bird:30169	1.149	http://arctos.database.museum/guid/MSB:Bird:30169
Passeriformes	Cisticolidae	<i>Cisticola subruficapilla</i>	MSB:Bird:30170	1.094	http://arctos.database.museum/guid/MSB:Bird:30170
Passeriformes	Cisticolidae	<i>Cisticola textrix</i>	MSB:Bird:30183	1.147	http://arctos.database.museum/guid/MSB:Bird:30183

Passeriformes	Cisticolidae	<i>Cisticola textrix</i>	MSB:Bird:30184	1.173	http://arctos.database.museum/guid/MSB:Bird:30184
Passeriformes	Cisticolidae	<i>Prinia flavicans</i>	MSB:Bird:30160	1.276	http://arctos.database.museum/guid/MSB:Bird:30160
Passeriformes	Cisticolidae	<i>Prinia flavicans</i>	MSB:Bird:30161	1.270	http://arctos.database.museum/guid/MSB:Bird:30161
Passeriformes	Cisticolidae	<i>Prinia maculosa</i>	MSB:Bird:30163	0.953	http://arctos.database.museum/guid/MSB:Bird:30163
Passeriformes	Cisticolidae	<i>Prinia maculosa</i>	MSB:Bird:30164	1.133	http://arctos.database.museum/guid/MSB:Bird:30164
Passeriformes	Conopophagidae	<i>Conopophaga castaneiceps</i>	MSB:Bird:36167	1.449	http://arctos.database.museum/guid/MSB:Bird:36167
Passeriformes	Cotingidae	<i>Ampelioides tschudii</i>	MSB:Bird:36865	1.624	http://arctos.database.museum/guid/MSB:Bird:36865
Passeriformes	Cotingidae	<i>Ampelion rubrocristatus</i>	MSB:Bird:35262	1.353	http://arctos.database.museum/guid/MSB:Bird:35262
Passeriformes	Cotingidae	<i>Ampelion rubrocristatus</i>	MSB:Bird:35998	1.330	http://arctos.database.museum/guid/MSB:Bird:35998
Passeriformes	Cotingidae	<i>Lipaugus vociferans</i>	MSB:Bird:37260	1.300	http://arctos.database.museum/guid/MSB:Bird:37260
Passeriformes	Cotingidae	<i>Pipreola frontalis</i>	MSB:Bird:36210	1.236	http://arctos.database.museum/guid/MSB:Bird:36210
Passeriformes	Cotingidae	<i>Pipreola frontalis</i>	MSB:Bird:36545	1.499	http://arctos.database.museum/guid/MSB:Bird:36545
Passeriformes	Cotingidae	<i>Querula purpurata</i>	MSB:Bird:37312	1.671	http://arctos.database.museum/guid/MSB:Bird:37312
Passeriformes	Cotingidae	<i>Querula purpurata</i>	MSB:Bird:37313	1.580	http://arctos.database.museum/guid/MSB:Bird:37313
Passeriformes	Cotingidae	<i>Snowornis cryptolophus</i>	MSB:Bird:36193	1.420	http://arctos.database.museum/guid/MSB:Bird:36193
Passeriformes	Cotingidae	<i>Snowornis subalaris</i>	MSB:Bird:36152	1.295	http://arctos.database.museum/guid/MSB:Bird:36152
Passeriformes	Cotingidae	<i>Snowornis subalaris</i>	MSB:Bird:36334	1.247	http://arctos.database.museum/guid/MSB:Bird:36334
Passeriformes	Dicruridae	<i>Dicrurus adsimilis</i>	MSB:Bird:30081	1.129	http://arctos.database.museum/guid/MSB:Bird:30081
Passeriformes	Emberizidae	<i>Emberiza flaviventris</i>	MSB:Bird:30127	1.379	http://arctos.database.museum/guid/MSB:Bird:30127
Passeriformes	Emberizidae	<i>Emberiza tahapisi</i>	MSB:Bird:30375	1.268	http://arctos.database.museum/guid/MSB:Bird:30375
Passeriformes	Emberizidae	<i>Emberiza tahapisi</i>	MSB:Bird:30376	1.237	http://arctos.database.museum/guid/MSB:Bird:30376
Passeriformes	Estrildidae	<i>Estrilda astrild</i>	MSB:Bird:30393	1.198	http://arctos.database.museum/guid/MSB:Bird:30393
Passeriformes	Estrildidae	<i>Estrilda astrild</i>	MSB:Bird:30394	1.195	http://arctos.database.museum/guid/MSB:Bird:30394
Passeriformes	Estrildidae	<i>Lagonosticta rhodopareia</i>	MSB:Bird:30264	1.623	http://arctos.database.museum/guid/MSB:Bird:30264
Passeriformes	Estrildidae	<i>Lagonosticta senegala</i>	MSB:Bird:30391	1.306	http://arctos.database.museum/guid/MSB:Bird:30391
Passeriformes	Estrildidae	<i>Lagonosticta senegala</i>	MSB:Bird:30392	1.215	http://arctos.database.museum/guid/MSB:Bird:30392
Passeriformes	Estrildidae	<i>Ortygospiza atricollis</i>	MSB:Bird:30398	1.371	http://arctos.database.museum/guid/MSB:Bird:30398
Passeriformes	Estrildidae	<i>Pytilia melba</i>	MSB:Bird:30296	1.422	http://arctos.database.museum/guid/MSB:Bird:30296
Passeriformes	Estrildidae	<i>Quelea quelea</i>	MSB:Bird:30253	1.251	http://arctos.database.museum/guid/MSB:Bird:30253
Passeriformes	Estrildidae	<i>Uraeginthus angolensis</i>	MSB:Bird:30260	1.292	http://arctos.database.museum/guid/MSB:Bird:30260
Passeriformes	Estrildidae	<i>Uraeginthus angolensis</i>	MSB:Bird:30261	1.252	http://arctos.database.museum/guid/MSB:Bird:30261
Passeriformes	Estrildidae	<i>Uraeginthus granatinus</i>	MSB:Bird:30258	1.377	http://arctos.database.museum/guid/MSB:Bird:30258

Passeriformes	Estrildidae	<i>Uraeginthus granatinus</i>	MSB:Bird:30259	1.182	http://arctos.database.museum/guid/MSB:Bird:30259
Passeriformes	Formicariidae	<i>Chamaeza campanisona</i>	MSB:Bird:36283	1.276	http://arctos.database.museum/guid/MSB:Bird:36283
Passeriformes	Formicariidae	<i>Chamaeza campanisona</i>	MSB:Bird:36355	1.287	http://arctos.database.museum/guid/MSB:Bird:36355
Passeriformes	Fringillidae	<i>Euphonia laniirostris</i>	MSB:Bird:34311	1.240	http://arctos.database.museum/guid/MSB:Bird:34311
Passeriformes	Fringillidae	<i>Euphonia laniirostris</i>	MSB:Bird:34329	1.268	http://arctos.database.museum/guid/MSB:Bird:34329
Passeriformes	Fringillidae	<i>Leucosticte tephrocotis</i>	MSB:Bird:30440	1.313	http://arctos.database.museum/guid/MSB:Bird:30440
Passeriformes	Fringillidae	<i>Serinus atrogularis</i>	MSB:Bird:30299	1.505	http://arctos.database.museum/guid/MSB:Bird:30299
Passeriformes	Fringillidae	<i>Serinus atrogularis</i>	MSB:Bird:30300	1.500	http://arctos.database.museum/guid/MSB:Bird:30300
Passeriformes	Fringillidae	<i>Serinus flaviventris</i>	MSB:Bird:30303	1.213	http://arctos.database.museum/guid/MSB:Bird:30303
Passeriformes	Fringillidae	<i>Serinus flaviventris</i>	MSB:Bird:30304	1.250	http://arctos.database.museum/guid/MSB:Bird:30304
Passeriformes	Fringillidae	<i>Sporagra uropygialis</i>	MSB:Bird:36003	1.394	http://arctos.database.museum/guid/MSB:Bird:36003
Passeriformes	Furnariidae	<i>Ancistrops strigilatus</i>	MSB:Bird:36432	1.431	http://arctos.database.museum/guid/MSB:Bird:36432
Passeriformes	Furnariidae	<i>Asthenes dorbignyi</i>	MSB:Bird:35101	1.266	http://arctos.database.museum/guid/MSB:Bird:35101
Passeriformes	Furnariidae	<i>Asthenes dorbignyi</i>	MSB:Bird:35706	1.325	http://arctos.database.museum/guid/MSB:Bird:35706
Passeriformes	Furnariidae	<i>Asthenes humilis</i>	MSB:Bird:34199	1.316	http://arctos.database.museum/guid/MSB:Bird:34199
Passeriformes	Furnariidae	<i>Asthenes humilis</i>	MSB:Bird:34200	1.298	http://arctos.database.museum/guid/MSB:Bird:34200
Passeriformes	Furnariidae	<i>Asthenes ottonis</i>	MSB:Bird:35845	1.311	http://arctos.database.museum/guid/MSB:Bird:35845
Passeriformes	Furnariidae	<i>Asthenes virgata</i>	MSB:Bird:34166	1.441	http://arctos.database.museum/guid/MSB:Bird:34166
Passeriformes	Furnariidae	<i>Automolus rubiginosus</i>	MSB:Bird:36285	1.301	http://arctos.database.museum/guid/MSB:Bird:36285
Passeriformes	Furnariidae	<i>Automolus rubiginosus</i>	MSB:Bird:36457	1.425	http://arctos.database.museum/guid/MSB:Bird:36457
Passeriformes	Furnariidae	<i>Campylorhamphus trochilirostris</i>	MSB:Bird:36197	1.226	http://arctos.database.museum/guid/MSB:Bird:36197
Passeriformes	Furnariidae	<i>Campylorhamphus trochilirostris</i>	MSB:Bird:36325	1.169	http://arctos.database.museum/guid/MSB:Bird:36325
Passeriformes	Furnariidae	<i>Cinclodes albidiventris</i>	MSB:Bird:28170	1.367	http://arctos.database.museum/guid/MSB:Bird:28170
Passeriformes	Furnariidae	<i>Cranioleuca albicapilla</i>	MSB:Bird:33915	1.218	http://arctos.database.museum/guid/MSB:Bird:33915
Passeriformes	Furnariidae	<i>Cranioleuca albicapilla</i>	MSB:Bird:35871	1.293	http://arctos.database.museum/guid/MSB:Bird:35871
Passeriformes	Furnariidae	<i>Cranioleuca antisiensis</i>	MSB:Bird:35307	1.336	http://arctos.database.museum/guid/MSB:Bird:35307
Passeriformes	Furnariidae	<i>Cranioleuca marcapatae</i>	MSB:Bird:34431	1.271	http://arctos.database.museum/guid/MSB:Bird:34431
Passeriformes	Furnariidae	<i>Cranioleuca marcapatae</i>	MSB:Bird:34446	1.282	http://arctos.database.museum/guid/MSB:Bird:34446
Passeriformes	Furnariidae	<i>Deconychura longicauda</i>	MSB:Bird:36709	1.262	http://arctos.database.museum/guid/MSB:Bird:36709
Passeriformes	Furnariidae	<i>Dendrocincla fuliginosa</i>	MSB:Bird:36447	1.311	http://arctos.database.museum/guid/MSB:Bird:36447
Passeriformes	Furnariidae	<i>Dendrocincla merula</i>	MSB:Bird:37130	1.160	http://arctos.database.museum/guid/MSB:Bird:37130

Passeriformes	Furnariidae	<i>Dendrocolaptes picumnus</i>	MSB:Bird:36834	1.152	http://arctos.database.museum/guid/MSB:Bird:36834
Passeriformes	Furnariidae	<i>Geositta maritima</i>	MSB:Bird:35450	1.292	http://arctos.database.museum/guid/MSB:Bird:35450
Passeriformes	Furnariidae	<i>Geositta maritima</i>	MSB:Bird:35452	1.279	http://arctos.database.museum/guid/MSB:Bird:35452
Passeriformes	Furnariidae	<i>Glyphorhynchus spirurus</i>	MSB:Bird:37179	1.141	http://arctos.database.museum/guid/MSB:Bird:37179
Passeriformes	Furnariidae	<i>Lepidocolaptes souleyetii</i>	MSB:Bird:33830	1.255	http://arctos.database.museum/guid/MSB:Bird:33830
Passeriformes	Furnariidae	<i>Lepidocolaptes souleyetii</i>	MSB:Bird:33831	1.257	http://arctos.database.museum/guid/MSB:Bird:33831
Passeriformes	Furnariidae	<i>Leptasthenura striata</i>	MSB:Bird:35097	1.239	http://arctos.database.museum/guid/MSB:Bird:35097
Passeriformes	Furnariidae	<i>Leptasthenura striata</i>	MSB:Bird:35099	1.290	http://arctos.database.museum/guid/MSB:Bird:35099
Passeriformes	Furnariidae	<i>Leptasthenura xenothorax</i>	MSB:Bird:34028	1.319	http://arctos.database.museum/guid/MSB:Bird:34028
Passeriformes	Furnariidae	<i>Leptasthenura xenothorax</i>	MSB:Bird:34031	1.276	http://arctos.database.museum/guid/MSB:Bird:34031
Passeriformes	Furnariidae	<i>Philydor erythrocerum</i>	MSB:Bird:36782	1.247	http://arctos.database.museum/guid/MSB:Bird:36782
Passeriformes	Furnariidae	<i>Philydor erythrocerum</i>	MSB:Bird:37213	1.163	http://arctos.database.museum/guid/MSB:Bird:37213
Passeriformes	Furnariidae	<i>Sclerurus caudacutus</i>	MSB:Bird:36440	1.347	http://arctos.database.museum/guid/MSB:Bird:36440
Passeriformes	Furnariidae	<i>Sclerurus mexicanus</i>	MSB:Bird:36338	1.273	http://arctos.database.museum/guid/MSB:Bird:36338
Passeriformes	Furnariidae	<i>Synallaxis gujanensis</i>	MSB:Bird:36630	1.347	http://arctos.database.museum/guid/MSB:Bird:36630
Passeriformes	Furnariidae	<i>Synallaxis gujanensis</i>	MSB:Bird:36702	1.352	http://arctos.database.museum/guid/MSB:Bird:36702
Passeriformes	Furnariidae	<i>Synallaxis rutilans</i>	MSB:Bird:37225	1.418	http://arctos.database.museum/guid/MSB:Bird:37225
Passeriformes	Furnariidae	<i>Synallaxis stictothorax</i>	MSB:Bird:33820	1.279	http://arctos.database.museum/guid/MSB:Bird:33820
Passeriformes	Furnariidae	<i>Synallaxis stictothorax</i>	MSB:Bird:33833	1.334	http://arctos.database.museum/guid/MSB:Bird:33833
Passeriformes	Furnariidae	<i>Syndactyla rufosuperciliata</i>	MSB:Bird:31918	1.289	http://arctos.database.museum/guid/MSB:Bird:31918
Passeriformes	Furnariidae	<i>Syndactyla subularis</i>	MSB:Bird:36173	1.125	http://arctos.database.museum/guid/MSB:Bird:36173
Passeriformes	Furnariidae	<i>Syndactyla subularis</i>	MSB:Bird:36220	1.221	http://arctos.database.museum/guid/MSB:Bird:36220
Passeriformes	Furnariidae	<i>Upucerthia albigula</i>	MSB:Bird:35488	1.277	http://arctos.database.museum/guid/MSB:Bird:35488
Passeriformes	Furnariidae	<i>Xiphorhynchus ocellatus</i>	MSB:Bird:36700	1.381	http://arctos.database.museum/guid/MSB:Bird:36700
Passeriformes	Grallariidae	<i>Grallaria andicolus</i>	MSB:Bird:36030	1.284	http://arctos.database.museum/guid/MSB:Bird:36030
Passeriformes	Grallariidae	<i>Grallaria ruficapilla</i>	MSB:Bird:35251	1.386	http://arctos.database.museum/guid/MSB:Bird:35251
Passeriformes	Grallariidae	<i>Grallaria squamigera</i>	MSB:Bird:33988	1.429	http://arctos.database.museum/guid/MSB:Bird:33988
Passeriformes	Hirundinidae	<i>Cecropis cucullata</i>	MSB:Bird:30084	1.423	http://arctos.database.museum/guid/MSB:Bird:30084
Passeriformes	Hirundinidae	<i>Cecropis semirufa</i>	MSB:Bird:30085	1.414	http://arctos.database.museum/guid/MSB:Bird:30085
Passeriformes	Hirundinidae	<i>Cecropis semirufa</i>	MSB:Bird:30086	1.309	http://arctos.database.museum/guid/MSB:Bird:30086
Passeriformes	Hirundinidae	<i>Hirundo dimidiata</i>	MSB:Bird:30370	1.390	http://arctos.database.museum/guid/MSB:Bird:30370
Passeriformes	Hirundinidae	<i>Hirundo dimidiata</i>	MSB:Bird:30371	1.429	http://arctos.database.museum/guid/MSB:Bird:30371

Passeriformes	Hirundinidae	<i>Pygochelidon cyanoleuca</i>	MSB:Bird:35280	1.433	http://arctos.database.museum/guid/MSB:Bird:35280
Passeriformes	Hirundinidae	<i>Pygochelidon cyanoleuca</i>	MSB:Bird:35315	1.467	http://arctos.database.museum/guid/MSB:Bird:35315
Passeriformes	Hirundinidae	<i>Stelgidopteryx serripennis</i>	MSB:Bird:29784	1.361	http://arctos.database.museum/guid/MSB:Bird:29784
Passeriformes	Icteridae	<i>Icterus graceannae</i>	MSB:Bird:33881	1.308	http://arctos.database.museum/guid/MSB:Bird:33881
Passeriformes	Icteridae	<i>Icterus graceannae</i>	MSB:Bird:33883	1.301	http://arctos.database.museum/guid/MSB:Bird:33883
Passeriformes	Icteridae	<i>Molothrus bonariensis</i>	MSB:Bird:35059	1.507	http://arctos.database.museum/guid/MSB:Bird:35059
Passeriformes	Icteridae	<i>Psarocolius angustifrons</i>	MSB:Bird:36699	1.349	http://arctos.database.museum/guid/MSB:Bird:36699
Passeriformes	Icteridae	<i>Sturnella bellicosa</i>	MSB:Bird:35042	1.448	http://arctos.database.museum/guid/MSB:Bird:35042
Passeriformes	Laniidae	<i>Lanius collurio</i>	MSB:Bird:30091	1.172	http://arctos.database.museum/guid/MSB:Bird:30091
Passeriformes	Laniidae	<i>Lanius collurio</i>	MSB:Bird:30092	1.252	http://arctos.database.museum/guid/MSB:Bird:30092
Passeriformes	Laniidae	<i>Lanius minor</i>	MSB:Bird:30095	1.274	http://arctos.database.museum/guid/MSB:Bird:30095
Passeriformes	Laniidae	<i>Urolestes melanoleucus</i>	MSB:Bird:30372	1.199	http://arctos.database.museum/guid/MSB:Bird:30372
Passeriformes	Laniidae	<i>Urolestes melanoleucus</i>	MSB:Bird:30373	1.174	http://arctos.database.museum/guid/MSB:Bird:30373
Passeriformes	Macrosphenidae	<i>Sylvietta rufescens</i>	MSB:Bird:30154	1.331	http://arctos.database.museum/guid/MSB:Bird:30154
Passeriformes	Macrosphenidae	<i>Sylvietta rufescens</i>	MSB:Bird:30155	1.298	http://arctos.database.museum/guid/MSB:Bird:30155
Passeriformes	Malaconotidae	<i>Laniarius atrococcineus</i>	MSB:Bird:30093	1.288	http://arctos.database.museum/guid/MSB:Bird:30093
Passeriformes	Malaconotidae	<i>Laniarius atrococcineus</i>	MSB:Bird:30094	1.297	http://arctos.database.museum/guid/MSB:Bird:30094
Passeriformes	Malaconotidae	<i>Nilaus afer</i>	MSB:Bird:30096	1.089	http://arctos.database.museum/guid/MSB:Bird:30096
Passeriformes	Malaconotidae	<i>Nilaus afer</i>	MSB:Bird:30097	1.271	http://arctos.database.museum/guid/MSB:Bird:30097
Passeriformes	Malaconotidae	<i>Tchagra australis</i>	MSB:Bird:30362	1.172	http://arctos.database.museum/guid/MSB:Bird:30362
Passeriformes	Malaconotidae	<i>Tchagra australis</i>	MSB:Bird:30363	1.218	http://arctos.database.museum/guid/MSB:Bird:30363
Passeriformes	Mimidae	<i>Mimus longicaudatus</i>	MSB:Bird:33695	1.292	http://arctos.database.museum/guid/MSB:Bird:33695
Passeriformes	Mimidae	<i>Mimus longicaudatus</i>	MSB:Bird:34666	1.347	http://arctos.database.museum/guid/MSB:Bird:34666
Passeriformes	Motacillidae	<i>Anthus cinnamomeus</i>	MSB:Bird:30206	1.285	http://arctos.database.museum/guid/MSB:Bird:30206
Passeriformes	Motacillidae	<i>Anthus crenatus</i>	MSB:Bird:30210	1.163	http://arctos.database.museum/guid/MSB:Bird:30210
Passeriformes	Motacillidae	<i>Anthus crenatus</i>	MSB:Bird:30211	1.205	http://arctos.database.museum/guid/MSB:Bird:30211
Passeriformes	Motacillidae	<i>Anthus similis</i>	MSB:Bird:30207	1.250	http://arctos.database.museum/guid/MSB:Bird:30207
Passeriformes	Motacillidae	<i>Anthus similis</i>	MSB:Bird:30208	1.273	http://arctos.database.museum/guid/MSB:Bird:30208
Passeriformes	Motacillidae	<i>Macronyx capensis</i>	MSB:Bird:30114	1.266	http://arctos.database.museum/guid/MSB:Bird:30114
Passeriformes	Motacillidae	<i>Macronyx capensis</i>	MSB:Bird:30115	1.363	http://arctos.database.museum/guid/MSB:Bird:30115
Passeriformes	Motacillidae	<i>Motacilla capensis</i>	MSB:Bird:30117	0.926	http://arctos.database.museum/guid/MSB:Bird:30117
Passeriformes	Motacillidae	<i>Motacilla capensis</i>	MSB:Bird:30118	1.183	http://arctos.database.museum/guid/MSB:Bird:30118

Passeriformes	Muscicapidae	<i>Bradornis mariquensis</i>	MSB:Bird:30123	1.313	http://arctos.database.museum/guid/MSB:Bird:30123
Passeriformes	Muscicapidae	<i>Cercomela familiaris</i>	MSB:Bird:30204	1.228	http://arctos.database.museum/guid/MSB:Bird:30204
Passeriformes	Muscicapidae	<i>Cercomela familiaris</i>	MSB:Bird:30205	1.218	http://arctos.database.museum/guid/MSB:Bird:30205
Passeriformes	Muscicapidae	<i>Cercotrichas coryphaeus</i>	MSB:Bird:30119	1.331	http://arctos.database.museum/guid/MSB:Bird:30119
Passeriformes	Muscicapidae	<i>Cercotrichas coryphaeus</i>	MSB:Bird:30120	1.356	http://arctos.database.museum/guid/MSB:Bird:30120
Passeriformes	Muscicapidae	<i>Cercotrichas paena</i>	MSB:Bird:30193	1.270	http://arctos.database.museum/guid/MSB:Bird:30193
Passeriformes	Muscicapidae	<i>Cercotrichas paena</i>	MSB:Bird:30194	1.187	http://arctos.database.museum/guid/MSB:Bird:30194
Passeriformes	Muscicapidae	<i>Monticola brevipes</i>	MSB:Bird:30135	1.388	http://arctos.database.museum/guid/MSB:Bird:30135
Passeriformes	Muscicapidae	<i>Muscicapa striata</i>	MSB:Bird:30152	1.475	http://arctos.database.museum/guid/MSB:Bird:30152
Passeriformes	Muscicapidae	<i>Muscicapa striata</i>	MSB:Bird:30153	1.441	http://arctos.database.museum/guid/MSB:Bird:30153
Passeriformes	Muscicapidae	<i>Myrmecocichla formicivora</i>	MSB:Bird:30133	1.181	http://arctos.database.museum/guid/MSB:Bird:30133
Passeriformes	Muscicapidae	<i>Myrmecocichla formicivora</i>	MSB:Bird:30134	1.221	http://arctos.database.museum/guid/MSB:Bird:30134
Passeriformes	Muscicapidae	<i>Oenanthe monticola</i>	MSB:Bird:30136	1.239	http://arctos.database.museum/guid/MSB:Bird:30136
Passeriformes	Muscicapidae	<i>Sigelus silens</i>	MSB:Bird:30128	1.354	http://arctos.database.museum/guid/MSB:Bird:30128
Passeriformes	Muscicapidae	<i>Sigelus silens</i>	MSB:Bird:30129	1.407	http://arctos.database.museum/guid/MSB:Bird:30129
Passeriformes	Paridae	<i>Baeolophus inornatus</i>	MSB:Bird:29202	1.342	http://arctos.database.museum/guid/MSB:Bird:29202
Passeriformes	Paridae	<i>Baeolophus inornatus</i>	MSB:Bird:29204	1.292	http://arctos.database.museum/guid/MSB:Bird:29204
Passeriformes	Paridae	<i>Parus cinerascens</i>	MSB:Bird:30185	1.207	http://arctos.database.museum/guid/MSB:Bird:30185
Passeriformes	Paridae	<i>Parus cinerascens</i>	MSB:Bird:30186	1.213	http://arctos.database.museum/guid/MSB:Bird:30186
Passeriformes	Parulidae	<i>Basileuterus bivittatus</i>	MSB:Bird:36644	1.447	http://arctos.database.museum/guid/MSB:Bird:36644
Passeriformes	Parulidae	<i>Basileuterus bivittatus</i>	MSB:Bird:36666	1.475	http://arctos.database.museum/guid/MSB:Bird:36666
Passeriformes	Parulidae	<i>Basileuterus trifasciatus</i>	MSB:Bird:35142	1.419	http://arctos.database.museum/guid/MSB:Bird:35142
Passeriformes	Parulidae	<i>Basileuterus trifasciatus</i>	MSB:Bird:35372	1.402	http://arctos.database.museum/guid/MSB:Bird:35372
Passeriformes	Parulidae	<i>Basileuterus tristriatus</i>	MSB:Bird:36146	1.452	http://arctos.database.museum/guid/MSB:Bird:36146
Passeriformes	Parulidae	<i>Cardellina canadensis</i>	MSB:Bird:35755	1.490	http://arctos.database.museum/guid/MSB:Bird:35755
Passeriformes	Parulidae	<i>Myioborus melanocephalus</i>	MSB:Bird:32101	1.396	http://arctos.database.museum/guid/MSB:Bird:32101
Passeriformes	Parulidae	<i>Myioborus melanocephalus</i>	MSB:Bird:34428	1.368	http://arctos.database.museum/guid/MSB:Bird:34428
Passeriformes	Parulidae	<i>Myioborus miniatus</i>	MSB:Bird:35235	1.372	http://arctos.database.museum/guid/MSB:Bird:35235
Passeriformes	Parulidae	<i>Myioborus miniatus</i>	MSB:Bird:35407	1.408	http://arctos.database.museum/guid/MSB:Bird:35407
Passeriformes	Parulidae	<i>Setophaga pitayumi</i>	MSB:Bird:34300	1.457	http://arctos.database.museum/guid/MSB:Bird:34300
Passeriformes	Parulidae	<i>Setophaga pitayumi</i>	MSB:Bird:36286	1.411	http://arctos.database.museum/guid/MSB:Bird:36286

Passeriformes	Passerellidae	<i>Ammodramus aurifrons</i>	MSB:Bird:36603	1.344	http://arctos.database.museum/guid/MSB:Bird:36603
Passeriformes	Passerellidae	<i>Ammodramus aurifrons</i>	MSB:Bird:36604	1.361	http://arctos.database.museum/guid/MSB:Bird:36604
Passeriformes	Passerellidae	<i>Arremon assimilis</i>	MSB:Bird:35176	1.663	http://arctos.database.museum/guid/MSB:Bird:35176
Passeriformes	Passerellidae	<i>Arremon assimilis</i>	MSB:Bird:35215	1.633	http://arctos.database.museum/guid/MSB:Bird:35215
Passeriformes	Passerellidae	<i>Arremon brunneinucha</i>	MSB:Bird:36147	1.367	http://arctos.database.museum/guid/MSB:Bird:36147
Passeriformes	Passerellidae	<i>Arremon brunneinucha</i>	MSB:Bird:36230	1.372	http://arctos.database.museum/guid/MSB:Bird:36230
Passeriformes	Passerellidae	<i>Arremon taciturnus</i>	MSB:Bird:36653	1.567	http://arctos.database.museum/guid/MSB:Bird:36653
Passeriformes	Passerellidae	<i>Arremon taciturnus</i>	MSB:Bird:36747	1.517	http://arctos.database.museum/guid/MSB:Bird:36747
Passeriformes	Passerellidae	<i>Atlapetes canigenis</i>	MSB:Bird:34430	1.556	http://arctos.database.museum/guid/MSB:Bird:34430
Passeriformes	Passerellidae	<i>Atlapetes forbesi</i>	MSB:Bird:33992	1.331	http://arctos.database.museum/guid/MSB:Bird:33992
Passeriformes	Passerellidae	<i>Atlapetes forbesi</i>	MSB:Bird:33993	1.356	http://arctos.database.museum/guid/MSB:Bird:33993
Passeriformes	Passerellidae	<i>Atlapetes rufigenis</i>	MSB:Bird:34961	1.403	http://arctos.database.museum/guid/MSB:Bird:34961
Passeriformes	Passerellidae	<i>Atlapetes rufigenis</i>	MSB:Bird:34962	1.301	http://arctos.database.museum/guid/MSB:Bird:34962
Passeriformes	Passerellidae	<i>Atlapetes seebohmi</i>	MSB:Bird:35335	1.516	http://arctos.database.museum/guid/MSB:Bird:35335
Passeriformes	Passerellidae	<i>Atlapetes seebohmi</i>	MSB:Bird:36012	1.392	http://arctos.database.museum/guid/MSB:Bird:36012
Passeriformes	Passerellidae	<i>Chlorospingus flavigularis</i>	MSB:Bird:36360	1.446	http://arctos.database.museum/guid/MSB:Bird:36360
Passeriformes	Passerellidae	<i>Passerculus sandwichensis</i>	MSB:Bird:40259	1.153	http://arctos.database.museum/guid/MSB:Bird:40259
Passeriformes	Passerellidae	<i>Rhynchospiza stolzmanni</i>	MSB:Bird:33703	1.444	http://arctos.database.museum/guid/MSB:Bird:33703
Passeriformes	Passerellidae	<i>Rhynchospiza stolzmanni</i>	MSB:Bird:33746	1.421	http://arctos.database.museum/guid/MSB:Bird:33746
Passeriformes	Passeridae	<i>Passer diffusus</i>	MSB:Bird:30108	1.329	http://arctos.database.museum/guid/MSB:Bird:30108
Passeriformes	Passeridae	<i>Passer diffusus</i>	MSB:Bird:30109	1.292	http://arctos.database.museum/guid/MSB:Bird:30109
Passeriformes	Passeridae	<i>Passer melanurus</i>	MSB:Bird:30106	1.316	http://arctos.database.museum/guid/MSB:Bird:30106
Passeriformes	Passeridae	<i>Passer melanurus</i>	MSB:Bird:30107	1.307	http://arctos.database.museum/guid/MSB:Bird:30107
Passeriformes	Pipridae	<i>Chiroxiphia boliviana</i>	MSB:Bird:36771	1.230	http://arctos.database.museum/guid/MSB:Bird:36771
Passeriformes	Pipridae	<i>Chiroxiphia pareola</i>	MSB:Bird:37275	1.236	http://arctos.database.museum/guid/MSB:Bird:37275
Passeriformes	Pipridae	<i>Lepidothrix coeruleocapilla</i>	MSB:Bird:36767	1.202	http://arctos.database.museum/guid/MSB:Bird:36767
Passeriformes	Pipridae	<i>Lepidothrix coeruleocapilla</i>	MSB:Bird:36815	1.249	http://arctos.database.museum/guid/MSB:Bird:36815
Passeriformes	Pipridae	<i>Lepidothrix coeruleocapilla</i>	MSB:Bird:36831	1.291	http://arctos.database.museum/guid/MSB:Bird:36831
Passeriformes	Pipridae	<i>Lepidothrix coronata</i>	MSB:Bird:36961	1.228	http://arctos.database.museum/guid/MSB:Bird:36961
Passeriformes	Pipridae	<i>Lepidothrix coronata</i>	MSB:Bird:37232	1.142	http://arctos.database.museum/guid/MSB:Bird:37232

Passeriformes	Pipridae	<i>Lepidothrix isidorei</i>	MSB:Bird:36125	1.221	http://arctos.database.museum/guid/MSB:Bird:36125
Passeriformes	Pipridae	<i>Lepidothrix isidorei</i>	MSB:Bird:36133	1.273	http://arctos.database.museum/guid/MSB:Bird:36133
Passeriformes	Pipridae	<i>Lepidothrix isidorei</i>	MSB:Bird:36267	1.207	http://arctos.database.museum/guid/MSB:Bird:36267
Passeriformes	Pipridae	<i>Piprites chloris</i>	MSB:Bird:37326	1.224	http://arctos.database.museum/guid/MSB:Bird:37326
Passeriformes	Platysteiridae	<i>Batis pririt</i>	MSB:Bird:30196	1.335	http://arctos.database.museum/guid/MSB:Bird:30196
Passeriformes	Platysteiridae	<i>Batis pririt</i>	MSB:Bird:30197	1.297	http://arctos.database.museum/guid/MSB:Bird:30197
Passeriformes	Ploceidae	<i>Euplectes afer</i>	MSB:Bird:30239	1.181	http://arctos.database.museum/guid/MSB:Bird:30239
Passeriformes	Ploceidae	<i>Euplectes afer</i>	MSB:Bird:30240	1.203	http://arctos.database.museum/guid/MSB:Bird:30240
Passeriformes	Ploceidae	<i>Euplectes albonotatus</i>	MSB:Bird:30244	1.248	http://arctos.database.museum/guid/MSB:Bird:30244
Passeriformes	Ploceidae	<i>Euplectes albonotatus</i>	MSB:Bird:30245	1.201	http://arctos.database.museum/guid/MSB:Bird:30245
Passeriformes	Ploceidae	<i>Euplectes ardens</i>	MSB:Bird:30235	1.114	http://arctos.database.museum/guid/MSB:Bird:30235
Passeriformes	Ploceidae	<i>Euplectes ardens</i>	MSB:Bird:30236	1.118	http://arctos.database.museum/guid/MSB:Bird:30236
Passeriformes	Ploceidae	<i>Euplectes orix</i>	MSB:Bird:30282	1.186	http://arctos.database.museum/guid/MSB:Bird:30282
Passeriformes	Ploceidae	<i>Euplectes progne</i>	MSB:Bird:30284	1.229	http://arctos.database.museum/guid/MSB:Bird:30284
Passeriformes	Ploceidae	<i>Euplectes progne</i>	MSB:Bird:30285	1.218	http://arctos.database.museum/guid/MSB:Bird:30285
Passeriformes	Ploceidae	<i>Philetairus socius</i>	MSB:Bird:30232	1.499	http://arctos.database.museum/guid/MSB:Bird:30232
Passeriformes	Ploceidae	<i>Philetairus socius</i>	MSB:Bird:30233	1.465	http://arctos.database.museum/guid/MSB:Bird:30233
Passeriformes	Ploceidae	<i>Plocepasser mahali</i>	MSB:Bird:30230	1.282	http://arctos.database.museum/guid/MSB:Bird:30230
Passeriformes	Ploceidae	<i>Plocepasser mahali</i>	MSB:Bird:30231	1.344	http://arctos.database.museum/guid/MSB:Bird:30231
Passeriformes	Ploceidae	<i>Ploceus capensis</i>	MSB:Bird:30271	1.167	http://arctos.database.museum/guid/MSB:Bird:30271
Passeriformes	Ploceidae	<i>Ploceus capensis</i>	MSB:Bird:30395	1.155	http://arctos.database.museum/guid/MSB:Bird:30395
Passeriformes	Ploceidae	<i>Sporopipes squamifrons</i>	MSB:Bird:30248	1.381	http://arctos.database.museum/guid/MSB:Bird:30248
Passeriformes	Poliotilidae	<i>Poliottila plumbea</i>	MSB:Bird:33721	1.246	http://arctos.database.museum/guid/MSB:Bird:33721
Passeriformes	Poliotilidae	<i>Poliottila plumbea</i>	MSB:Bird:33824	1.256	http://arctos.database.museum/guid/MSB:Bird:33824
Passeriformes	Ptiligonatidae	<i>Phainopepla nitens</i>	MSB:Bird:29255	1.826	http://arctos.database.museum/guid/MSB:Bird:29255
Passeriformes	Pycnonotidae	<i>Pycnonotus nigricans</i>	MSB:Bird:30359	1.205	http://arctos.database.museum/guid/MSB:Bird:30359
Passeriformes	Pycnonotidae	<i>Pycnonotus nigricans</i>	MSB:Bird:30360	1.215	http://arctos.database.museum/guid/MSB:Bird:30360
Passeriformes	Stenostiridae	<i>Stenostira scita</i>	MSB:Bird:30148	1.236	http://arctos.database.museum/guid/MSB:Bird:30148
Passeriformes	Stenostiridae	<i>Stenostira scita</i>	MSB:Bird:30149	1.227	http://arctos.database.museum/guid/MSB:Bird:30149
Passeriformes	Sturnidae	<i>Lamprotornis nitens</i>	MSB:Bird:30100	1.167	http://arctos.database.museum/guid/MSB:Bird:30100
Passeriformes	Sturnidae	<i>Lamprotornis nitens</i>	MSB:Bird:30101	1.276	http://arctos.database.museum/guid/MSB:Bird:30101
Passeriformes	Sylviidae	<i>Chamaea fasciata</i>	MSB:Bird:29211	1.348	http://arctos.database.museum/guid/MSB:Bird:29211

Passeriformes	Sylviidae	<i>Parisoma subcaeruleum</i>	MSB:Bird:30142	1.293	http://arctos.database.museum/guid/MSB:Bird:30142
Passeriformes	Sylviidae	<i>Parisoma subcaeruleum</i>	MSB:Bird:30145	1.220	http://arctos.database.museum/guid/MSB:Bird:30145
Passeriformes	Sylviidae	<i>Phylloscopus trochilus</i>	MSB:Bird:30167	1.323	http://arctos.database.museum/guid/MSB:Bird:30167
Passeriformes	Sylviidae	<i>Sylvia communis</i>	MSB:Bird:30198	1.302	http://arctos.database.museum/guid/MSB:Bird:30198
Passeriformes	Thamnophilidae	<i>Cercomacra serva</i>	MSB:Bird:36612	1.298	http://arctos.database.museum/guid/MSB:Bird:36612
Passeriformes	Thamnophilidae	<i>Epinecrophylla spodionota</i>	MSB:Bird:36349	1.389	http://arctos.database.museum/guid/MSB:Bird:36349
Passeriformes	Thamnophilidae	<i>Epinecrophylla spodionota</i>	MSB:Bird:36436	1.343	http://arctos.database.museum/guid/MSB:Bird:36436
Passeriformes	Thamnophilidae	<i>Gymnopathys salvini</i>	MSB:Bird:37222	1.277	http://arctos.database.museum/guid/MSB:Bird:37222
Passeriformes	Thamnophilidae	<i>Gymnopathys salvini</i>	MSB:Bird:37274	1.314	http://arctos.database.museum/guid/MSB:Bird:37274
Passeriformes	Thamnophilidae	<i>Hylophylax naevius</i>	MSB:Bird:36641	1.433	http://arctos.database.museum/guid/MSB:Bird:36641
Passeriformes	Thamnophilidae	<i>Hylophylax naevius</i>	MSB:Bird:36656	1.454	http://arctos.database.museum/guid/MSB:Bird:36656
Passeriformes	Thamnophilidae	<i>Hypocnemis subflava</i>	MSB:Bird:27299	1.316	http://arctos.database.museum/guid/MSB:Bird:27299
Passeriformes	Thamnophilidae	<i>Microrhopias quixensis</i>	MSB:Bird:36732	1.388	http://arctos.database.museum/guid/MSB:Bird:36732
Passeriformes	Thamnophilidae	<i>Microrhopias quixensis</i>	MSB:Bird:36735	1.349	http://arctos.database.museum/guid/MSB:Bird:36735
Passeriformes	Thamnophilidae	<i>Myrmeciza fortis</i>	MSB:Bird:37156	1.302	http://arctos.database.museum/guid/MSB:Bird:37156
Passeriformes	Thamnophilidae	<i>Myrmoborus leucophrys</i>	MSB:Bird:36619	1.470	http://arctos.database.museum/guid/MSB:Bird:36619
Passeriformes	Thamnophilidae	<i>Myrmoborus leucophrys</i>	MSB:Bird:36646	1.470	http://arctos.database.museum/guid/MSB:Bird:36646
Passeriformes	Thamnophilidae	<i>Myrmotherula longicauda</i>	MSB:Bird:36614	1.362	http://arctos.database.museum/guid/MSB:Bird:36614
Passeriformes	Thamnophilidae	<i>Myrmotherula longipennis</i>	MSB:Bird:37251	1.321	http://arctos.database.museum/guid/MSB:Bird:37251
Passeriformes	Thamnophilidae	<i>Myrmotherula schisticolor</i>	MSB:Bird:36115	1.260	http://arctos.database.museum/guid/MSB:Bird:36115
Passeriformes	Thamnophilidae	<i>Myrmotherula schisticolor</i>	MSB:Bird:36358	1.321	http://arctos.database.museum/guid/MSB:Bird:36358
Passeriformes	Thamnophilidae	<i>Pyriglena leuconota</i>	MSB:Bird:36697	1.380	http://arctos.database.museum/guid/MSB:Bird:36697
Passeriformes	Thamnophilidae	<i>Rhegmatorhina melanosticta</i>	MSB:Bird:36483	1.377	http://arctos.database.museum/guid/MSB:Bird:36483
Passeriformes	Thamnophilidae	<i>Rhegmatorhina melanosticta</i>	MSB:Bird:37160	1.279	http://arctos.database.museum/guid/MSB:Bird:37160
Passeriformes	Thamnophilidae	<i>Thamnistes anabatinus</i>	MSB:Bird:36251	1.220	http://arctos.database.museum/guid/MSB:Bird:36251
Passeriformes	Thamnophilidae	<i>Thamnistes anabatinus</i>	MSB:Bird:36271	1.383	http://arctos.database.museum/guid/MSB:Bird:36271
Passeriformes	Thamnophilidae	<i>Thamnophilus aethiops</i>	MSB:Bird:37334	1.338	http://arctos.database.museum/guid/MSB:Bird:37334
Passeriformes	Thamnophilidae	<i>Thamnophilus bernardi</i>	MSB:Bird:34668	1.508	http://arctos.database.museum/guid/MSB:Bird:34668
Passeriformes	Thamnophilidae	<i>Thamnophilus bernardi</i>	MSB:Bird:34728	1.415	http://arctos.database.museum/guid/MSB:Bird:34728
Passeriformes	Thamnophilidae	<i>Thamnophilus doliatus</i>	MSB:Bird:34301	1.467	http://arctos.database.museum/guid/MSB:Bird:34301
Passeriformes	Thamnophilidae	<i>Thamnophilus doliatus</i>	MSB:Bird:37242	1.443	http://arctos.database.museum/guid/MSB:Bird:37242

Passeriformes	Thamnophilidae	<i>Thamnophilus murinus</i>	MSB:Bird:36433	1.447	http://arctos.database.museum/guid/MSB:Bird:36433
Passeriformes	Thamnophilidae	<i>Thamnophilus palliatus</i>	MSB:Bird:36613	1.460	http://arctos.database.museum/guid/MSB:Bird:36613
Passeriformes	Thamnophilidae	<i>Thamnophilus palliatus</i>	MSB:Bird:36836	1.446	http://arctos.database.museum/guid/MSB:Bird:36836
Passeriformes	Thraupidae	<i>Anisognathus somptuosus</i>	MSB:Bird:36201	1.139	http://arctos.database.museum/guid/MSB:Bird:36201
Passeriformes	Thraupidae	<i>Catamblyrhynchus diadema</i>	MSB:Bird:35391	1.294	http://arctos.database.museum/guid/MSB:Bird:35391
Passeriformes	Thraupidae	<i>Cissopis leverianus</i>	MSB:Bird:36364	1.254	http://arctos.database.museum/guid/MSB:Bird:36364
Passeriformes	Thraupidae	<i>Coereba flaveola</i>	MSB:Bird:33687	1.493	http://arctos.database.museum/guid/MSB:Bird:33687
Passeriformes	Thraupidae	<i>Conirostrum ferrugineiventre</i>	MSB:Bird:33053	1.393	http://arctos.database.museum/guid/MSB:Bird:33053
Passeriformes	Thraupidae	<i>Conirostrum ferrugineiventre</i>	MSB:Bird:33909	1.346	http://arctos.database.museum/guid/MSB:Bird:33909
Passeriformes	Thraupidae	<i>Coryphospingus cucullatus</i>	MSB:Bird:34305	1.297	http://arctos.database.museum/guid/MSB:Bird:34305
Passeriformes	Thraupidae	<i>Dacnis cayana</i>	MSB:Bird:36539	1.583	http://arctos.database.museum/guid/MSB:Bird:36539
Passeriformes	Thraupidae	<i>Dacnis cayana</i>	MSB:Bird:36698	1.307	http://arctos.database.museum/guid/MSB:Bird:36698
Passeriformes	Thraupidae	<i>Delothraupis castaneiventris</i>	MSB:Bird:33989	1.308	http://arctos.database.museum/guid/MSB:Bird:33989
Passeriformes	Thraupidae	<i>Diglossa albilateralis</i>	MSB:Bird:35904	1.324	http://arctos.database.museum/guid/MSB:Bird:35904
Passeriformes	Thraupidae	<i>Diglossa caeruleascens</i>	MSB:Bird:32450	1.302	http://arctos.database.museum/guid/MSB:Bird:32450
Passeriformes	Thraupidae	<i>Diglossa cyanea</i>	MSB:Bird:34429	1.250	http://arctos.database.museum/guid/MSB:Bird:34429
Passeriformes	Thraupidae	<i>Diglossa cyanea</i>	MSB:Bird:34432	1.202	http://arctos.database.museum/guid/MSB:Bird:34432
Passeriformes	Thraupidae	<i>Diglossa humeralis</i>	MSB:Bird:31390	1.287	http://arctos.database.museum/guid/MSB:Bird:31390
Passeriformes	Thraupidae	<i>Diglossa mystacalis</i>	MSB:Bird:27018	1.173	http://arctos.database.museum/guid/MSB:Bird:27018
Passeriformes	Thraupidae	<i>Diglossa sittoides</i>	MSB:Bird:34055	1.290	http://arctos.database.museum/guid/MSB:Bird:34055
Passeriformes	Thraupidae	<i>Diglossa sittoides</i>	MSB:Bird:35154	1.332	http://arctos.database.museum/guid/MSB:Bird:35154
Passeriformes	Thraupidae	<i>Dubusia taeniata</i>	MSB:Bird:34384	1.560	http://arctos.database.museum/guid/MSB:Bird:34384
Passeriformes	Thraupidae	<i>Hemispingus atropileus</i>	MSB:Bird:34561	1.107	http://arctos.database.museum/guid/MSB:Bird:34561
Passeriformes	Thraupidae	<i>Hemispingus melanotis</i>	MSB:Bird:35171	1.319	http://arctos.database.museum/guid/MSB:Bird:35171
Passeriformes	Thraupidae	<i>Lanio versicolor</i>	MSB:Bird:36385	1.315	http://arctos.database.museum/guid/MSB:Bird:36385
Passeriformes	Thraupidae	<i>Oryzoborus angolensis</i>	MSB:Bird:37265	1.291	http://arctos.database.museum/guid/MSB:Bird:37265
Passeriformes	Thraupidae	<i>Phrygilus punensis</i>	MSB:Bird:34935	1.350	http://arctos.database.museum/guid/MSB:Bird:34935
Passeriformes	Thraupidae	<i>Phrygilus punensis</i>	MSB:Bird:34949	1.377	http://arctos.database.museum/guid/MSB:Bird:34949
Passeriformes	Thraupidae	<i>Piezorhina cinerea</i>	MSB:Bird:33846	1.387	http://arctos.database.museum/guid/MSB:Bird:33846
Passeriformes	Thraupidae	<i>Piezorhina cinerea</i>	MSB:Bird:34708	1.430	http://arctos.database.museum/guid/MSB:Bird:34708

Passeriformes	Thraupidae	<i>Poospiza alticola</i>	MSB:Bird:34932	1.276	http://arctos.database.museum/guid/MSB:Bird:34932
Passeriformes	Thraupidae	<i>Poospiza alticola</i>	MSB:Bird:34973	1.305	http://arctos.database.museum/guid/MSB:Bird:34973
Passeriformes	Thraupidae	<i>Poospiza caesar</i>	MSB:Bird:33104	1.417	http://arctos.database.museum/guid/MSB:Bird:33104
Passeriformes	Thraupidae	<i>Poospiza caesar</i>	MSB:Bird:35848	1.412	http://arctos.database.museum/guid/MSB:Bird:35848
Passeriformes	Thraupidae	<i>Poospiza rubecula</i>	MSB:Bird:34958	1.345	http://arctos.database.museum/guid/MSB:Bird:34958
Passeriformes	Thraupidae	<i>Ramphocelus carbo</i>	MSB:Bird:36600	1.380	http://arctos.database.museum/guid/MSB:Bird:36600
Passeriformes	Thraupidae	<i>Saltator maximus</i>	MSB:Bird:36671	1.397	http://arctos.database.museum/guid/MSB:Bird:36671
Passeriformes	Thraupidae	<i>Schistochlamys melanopsis</i>	MSB:Bird:34328	1.360	http://arctos.database.museum/guid/MSB:Bird:34328
Passeriformes	Thraupidae	<i>Sicalis luteola</i>	MSB:Bird:34774	1.159	http://arctos.database.museum/guid/MSB:Bird:34774
Passeriformes	Thraupidae	<i>Sicalis luteola</i>	MSB:Bird:36076	1.443	http://arctos.database.museum/guid/MSB:Bird:36076
Passeriformes	Thraupidae	<i>Sicalis olivascens</i>	MSB:Bird:34934	1.320	http://arctos.database.museum/guid/MSB:Bird:34934
Passeriformes	Thraupidae	<i>Sporophila caerulescens</i>	MSB:Bird:37247	1.232	http://arctos.database.museum/guid/MSB:Bird:37247
Passeriformes	Thraupidae	<i>Sporophila caerulescens</i>	MSB:Bird:37287	1.214	http://arctos.database.museum/guid/MSB:Bird:37287
Passeriformes	Thraupidae	<i>Sporophila nigricollis</i>	MSB:Bird:34315	1.360	http://arctos.database.museum/guid/MSB:Bird:34315
Passeriformes	Thraupidae	<i>Sporophila peruviana</i>	MSB:Bird:34765	1.277	http://arctos.database.museum/guid/MSB:Bird:34765
Passeriformes	Thraupidae	<i>Sporophila peruviana</i>	MSB:Bird:34910	1.296	http://arctos.database.museum/guid/MSB:Bird:34910
Passeriformes	Thraupidae	<i>Tachyphonus rufus</i>	MSB:Bird:34320	1.407	http://arctos.database.museum/guid/MSB:Bird:34320
Passeriformes	Thraupidae	<i>Tachyphonus rufus</i>	MSB:Bird:34331	1.347	http://arctos.database.museum/guid/MSB:Bird:34331
Passeriformes	Thraupidae	<i>Tangara cyanicollis</i>	MSB:Bird:36322	1.325	http://arctos.database.museum/guid/MSB:Bird:36322
Passeriformes	Thraupidae	<i>Tangara cyanicollis</i>	MSB:Bird:36623	1.293	http://arctos.database.museum/guid/MSB:Bird:36623
Passeriformes	Thraupidae	<i>Tangara mexicana</i>	MSB:Bird:37255	1.291	http://arctos.database.museum/guid/MSB:Bird:37255
Passeriformes	Thraupidae	<i>Tangara vassorii</i>	MSB:Bird:35365	1.375	http://arctos.database.museum/guid/MSB:Bird:35365
Passeriformes	Thraupidae	<i>Thlypopsis ornata</i>	MSB:Bird:34831	1.340	http://arctos.database.museum/guid/MSB:Bird:34831
Passeriformes	Thraupidae	<i>Thlypopsis ornata</i>	MSB:Bird:36075	1.384	http://arctos.database.museum/guid/MSB:Bird:36075
Passeriformes	Thraupidae	<i>Thlypopsis ruficeps</i>	MSB:Bird:33949	1.401	http://arctos.database.museum/guid/MSB:Bird:33949
Passeriformes	Thraupidae	<i>Thlypopsis ruficeps</i>	MSB:Bird:33959	1.407	http://arctos.database.museum/guid/MSB:Bird:33959
Passeriformes	Thraupidae	<i>Thraupis bonariensis</i>	MSB:Bird:36048	1.274	http://arctos.database.museum/guid/MSB:Bird:36048
Passeriformes	Thraupidae	<i>Thraupis episcopus</i>	MSB:Bird:33795	1.367	http://arctos.database.museum/guid/MSB:Bird:33795
Passeriformes	Thraupidae	<i>Thraupis palmarum</i>	MSB:Bird:37183	1.231	http://arctos.database.museum/guid/MSB:Bird:37183
Passeriformes	Thraupidae	<i>Thraupis palmarum</i>	MSB:Bird:37241	1.300	http://arctos.database.museum/guid/MSB:Bird:37241
Passeriformes	Thraupidae	<i>Tiaris obscurus</i>	MSB:Bird:34717	1.298	http://arctos.database.museum/guid/MSB:Bird:34717
Passeriformes	Thraupidae	<i>Xenodacnis parina</i>	MSB:Bird:35992	1.231	http://arctos.database.museum/guid/MSB:Bird:35992

Passeriformes	Thraupidae	<i>Xenodacnis parina</i>	MSB:Bird:36021	1.275	http://arctos.database.museum/guid/MSB:Bird:36021
Passeriformes	Thraupidae	<i>Xenospingus concolor</i>	MSB:Bird:35445	1.376	http://arctos.database.museum/guid/MSB:Bird:35445
Passeriformes	Tityridae	<i>Laniocera hypopyrra</i>	MSB:Bird:36441	1.363	http://arctos.database.museum/guid/MSB:Bird:36441
Passeriformes	Tityridae	<i>Pachyramphus polychopterus</i>	MSB:Bird:34275	1.264	http://arctos.database.museum/guid/MSB:Bird:34275
Passeriformes	Tityridae	<i>Pachyramphus versicolor</i>	MSB:Bird:31874	1.285	http://arctos.database.museum/guid/MSB:Bird:31874
Passeriformes	Tityridae	<i>Pachyramphus viridis</i>	MSB:Bird:36493	1.299	http://arctos.database.museum/guid/MSB:Bird:36493
Passeriformes	Tityridae	<i>Schiffornis turdina</i>	MSB:Bird:36136	1.240	http://arctos.database.museum/guid/MSB:Bird:36136
Passeriformes	Tityridae	<i>Schiffornis turdina</i>	MSB:Bird:36772	1.386	http://arctos.database.museum/guid/MSB:Bird:36772
Passeriformes	Troglodytidae	<i>Campylorhynchus fasciatus</i>	MSB:Bird:34725	1.359	http://arctos.database.museum/guid/MSB:Bird:34725
Passeriformes	Troglodytidae	<i>Campylorhynchus fasciatus</i>	MSB:Bird:35366	1.495	http://arctos.database.museum/guid/MSB:Bird:35366
Passeriformes	Troglodytidae	<i>Cantorchilus superciliaris</i>	MSB:Bird:33737	1.285	http://arctos.database.museum/guid/MSB:Bird:33737
Passeriformes	Troglodytidae	<i>Cantorchilus superciliaris</i>	MSB:Bird:33753	1.307	http://arctos.database.museum/guid/MSB:Bird:33753
Passeriformes	Troglodytidae	<i>Cyphorhinus thoracicus</i>	MSB:Bird:36781	1.260	http://arctos.database.museum/guid/MSB:Bird:36781
Passeriformes	Troglodytidae	<i>Cyphorhinus thoracicus</i>	MSB:Bird:36797	1.277	http://arctos.database.museum/guid/MSB:Bird:36797
Passeriformes	Troglodytidae	<i>Pheugopedius eisenmanni</i>	MSB:Bird:34609	1.251	http://arctos.database.museum/guid/MSB:Bird:34609
Passeriformes	Troglodytidae	<i>Troglodytes aedon</i>	MSB:Bird:36909	1.338	http://arctos.database.museum/guid/MSB:Bird:36909
Passeriformes	Turdidae	<i>Catharus dryas</i>	MSB:Bird:36137	1.402	http://arctos.database.museum/guid/MSB:Bird:36137
Passeriformes	Turdidae	<i>Catharus ustulatus</i>	MSB:Bird:35792	1.488	http://arctos.database.museum/guid/MSB:Bird:35792
Passeriformes	Turdidae	<i>Turdus chiguanco</i>	MSB:Bird:35914	1.486	http://arctos.database.museum/guid/MSB:Bird:35914
Passeriformes	Turdidae	<i>Turdus chiguanco</i>	MSB:Bird:36069	1.396	http://arctos.database.museum/guid/MSB:Bird:36069
Passeriformes	Turdidae	<i>Turdus leucops</i>	MSB:Bird:36237	1.351	http://arctos.database.museum/guid/MSB:Bird:36237
Passeriformes	Turdidae	<i>Turdus leucops</i>	MSB:Bird:36238	1.284	http://arctos.database.museum/guid/MSB:Bird:36238
Passeriformes	Turdidae	<i>Turdus nigriceps</i>	MSB:Bird:36199	1.348	http://arctos.database.museum/guid/MSB:Bird:36199
Passeriformes	Turdidae	<i>Turdus reevei</i>	MSB:Bird:33792	1.371	http://arctos.database.museum/guid/MSB:Bird:33792
Passeriformes	Turdidae	<i>Turdus smithi</i>	MSB:Bird:30103	1.618	http://arctos.database.museum/guid/MSB:Bird:30103
Passeriformes	Turdidae	<i>Turdus smithi</i>	MSB:Bird:30105	1.625	http://arctos.database.museum/guid/MSB:Bird:30105
Passeriformes	Tyrannidae	<i>Anairetes agraphia</i>	MSB:Bird:34372	1.301	http://arctos.database.museum/guid/MSB:Bird:34372
Passeriformes	Tyrannidae	<i>Anairetes alpinus</i>	MSB:Bird:34088	1.256	http://arctos.database.museum/guid/MSB:Bird:34088
Passeriformes	Tyrannidae	<i>Anairetes alpinus</i>	MSB:Bird:34105	1.222	http://arctos.database.museum/guid/MSB:Bird:34105
Passeriformes	Tyrannidae	<i>Anairetes flavirostris</i>	MSB:Bird:34056	1.330	http://arctos.database.museum/guid/MSB:Bird:34056
Passeriformes	Tyrannidae	<i>Anairetes flavirostris</i>	MSB:Bird:34058	1.331	http://arctos.database.museum/guid/MSB:Bird:34058

Passeriformes	Tyrannidae	<i>Anairetes flavirostris</i>	MSB:Bird:35102	1.302	http://arctos.database.museum/guid/MSB:Bird:35102
Passeriformes	Tyrannidae	<i>Anairetes nigrocristatus</i>	MSB:Bird:35005	1.250	http://arctos.database.museum/guid/MSB:Bird:35005
Passeriformes	Tyrannidae	<i>Anairetes nigrocristatus</i>	MSB:Bird:36072	1.297	http://arctos.database.museum/guid/MSB:Bird:36072
Passeriformes	Tyrannidae	<i>Campostoma obsoletum</i>	MSB:Bird:37109	1.199	http://arctos.database.museum/guid/MSB:Bird:37109
Passeriformes	Tyrannidae	<i>Contopus cinereus</i>	MSB:Bird:33768	1.271	http://arctos.database.museum/guid/MSB:Bird:33768
Passeriformes	Tyrannidae	<i>Contopus cinereus</i>	MSB:Bird:35346	1.216	http://arctos.database.museum/guid/MSB:Bird:35346
Passeriformes	Tyrannidae	<i>Contopus fumigatus</i>	MSB:Bird:36304	1.128	http://arctos.database.museum/guid/MSB:Bird:36304
Passeriformes	Tyrannidae	<i>Elaenia albiceps</i>	MSB:Bird:35363	1.327	http://arctos.database.museum/guid/MSB:Bird:35363
Passeriformes	Tyrannidae	<i>Elaenia albiceps</i>	MSB:Bird:36047	1.312	http://arctos.database.museum/guid/MSB:Bird:36047
Passeriformes	Tyrannidae	<i>Elaenia chiriquensis</i>	MSB:Bird:31843	1.246	http://arctos.database.museum/guid/MSB:Bird:31843
Passeriformes	Tyrannidae	<i>Elaenia pallatangae</i>	MSB:Bird:34370	1.272	http://arctos.database.museum/guid/MSB:Bird:34370
Passeriformes	Tyrannidae	<i>Elaenia pallatangae</i>	MSB:Bird:34536	1.229	http://arctos.database.museum/guid/MSB:Bird:34536
Passeriformes	Tyrannidae	<i>Empidonax alnorum</i>	MSB:Bird:35775	1.213	http://arctos.database.museum/guid/MSB:Bird:35775
Passeriformes	Tyrannidae	<i>Empidonax alnorum</i>	MSB:Bird:36331	1.236	http://arctos.database.museum/guid/MSB:Bird:36331
Passeriformes	Tyrannidae	<i>Euscarthmus meloryphus</i>	MSB:Bird:34672	1.282	http://arctos.database.museum/guid/MSB:Bird:34672
Passeriformes	Tyrannidae	<i>Euscarthmus meloryphus</i>	MSB:Bird:34752	1.360	http://arctos.database.museum/guid/MSB:Bird:34752
Passeriformes	Tyrannidae	<i>Hemitriccus rufifigularis</i>	MSB:Bird:36174	1.445	http://arctos.database.museum/guid/MSB:Bird:36174
Passeriformes	Tyrannidae	<i>Knipolegus aterrimus</i>	MSB:Bird:35709	1.183	http://arctos.database.museum/guid/MSB:Bird:35709
Passeriformes	Tyrannidae	<i>Knipolegus aterrimus</i>	MSB:Bird:35713	1.243	http://arctos.database.museum/guid/MSB:Bird:35713
Passeriformes	Tyrannidae	<i>Knipolegus poecilocercus</i>	MSB:Bird:35930	1.211	http://arctos.database.museum/guid/MSB:Bird:35930
Passeriformes	Tyrannidae	<i>Lathrotriccus euleri</i>	MSB:Bird:36112	1.280	http://arctos.database.museum/guid/MSB:Bird:36112
Passeriformes	Tyrannidae	<i>Leptopogon superciliaris</i>	MSB:Bird:36786	1.176	http://arctos.database.museum/guid/MSB:Bird:36786
Passeriformes	Tyrannidae	<i>Leptopogon superciliaris</i>	MSB:Bird:36807	1.232	http://arctos.database.museum/guid/MSB:Bird:36807
Passeriformes	Tyrannidae	<i>Lophotriccus eulophotes</i>	MSB:Bird:37200	1.190	http://arctos.database.museum/guid/MSB:Bird:37200
Passeriformes	Tyrannidae	<i>Lophotriccus pileatus</i>	MSB:Bird:36788	1.126	http://arctos.database.museum/guid/MSB:Bird:36788
Passeriformes	Tyrannidae	<i>Mionectes macconnelli</i>	MSB:Bird:37121	1.180	http://arctos.database.museum/guid/MSB:Bird:37121
Passeriformes	Tyrannidae	<i>Mionectes macconnelli</i>	MSB:Bird:37207	1.233	http://arctos.database.museum/guid/MSB:Bird:37207
Passeriformes	Tyrannidae	<i>Mionectes macconnelli</i>	MSB:Bird:37285	1.210	http://arctos.database.museum/guid/MSB:Bird:37285
Passeriformes	Tyrannidae	<i>Mionectes oleagineus</i>	MSB:Bird:37139	1.125	http://arctos.database.museum/guid/MSB:Bird:37139
Passeriformes	Tyrannidae	<i>Mionectes olivaceus</i>	MSB:Bird:36629	1.326	http://arctos.database.museum/guid/MSB:Bird:36629
Passeriformes	Tyrannidae	<i>Mionectes olivaceus</i>	MSB:Bird:36650	1.274	http://arctos.database.museum/guid/MSB:Bird:36650
Passeriformes	Tyrannidae	<i>Mionectes olivaceus</i>	MSB:Bird:36708	1.314	http://arctos.database.museum/guid/MSB:Bird:36708

Passeriformes	Tyrannidae	<i>Mionectes striaticollis</i>	MSB:Bird:36273	1.321	http://arctos.database.museum/guid/MSB:Bird:36273
Passeriformes	Tyrannidae	<i>Mionectes striaticollis</i>	MSB:Bird:36744	1.329	http://arctos.database.museum/guid/MSB:Bird:36744
Passeriformes	Tyrannidae	<i>Muscigralla brevicauda</i>	MSB:Bird:34214	1.218	http://arctos.database.museum/guid/MSB:Bird:34214
Passeriformes	Tyrannidae	<i>Muscigralla brevicauda</i>	MSB:Bird:34716	1.230	http://arctos.database.museum/guid/MSB:Bird:34716
Passeriformes	Tyrannidae	<i>Muscisaxicola fluviatilis</i>	MSB:Bird:36748	1.252	http://arctos.database.museum/guid/MSB:Bird:36748
Passeriformes	Tyrannidae	<i>Muscisaxicola fluviatilis</i>	MSB:Bird:36776	1.192	http://arctos.database.museum/guid/MSB:Bird:36776
Passeriformes	Tyrannidae	<i>Myiarchus tuberculifer</i>	MSB:Bird:35261	1.230	http://arctos.database.museum/guid/MSB:Bird:35261
Passeriformes	Tyrannidae	<i>Myiobius villosus</i>	MSB:Bird:36838	1.203	http://arctos.database.museum/guid/MSB:Bird:36838
Passeriformes	Tyrannidae	<i>Myiodynastes bairdii</i>	MSB:Bird:33774	1.265	http://arctos.database.museum/guid/MSB:Bird:33774
Passeriformes	Tyrannidae	<i>Myiodynastes bairdii</i>	MSB:Bird:34800	1.286	http://arctos.database.museum/guid/MSB:Bird:34800
Passeriformes	Tyrannidae	<i>Myiodynastes maculatus</i>	MSB:Bird:34312	1.307	http://arctos.database.museum/guid/MSB:Bird:34312
Passeriformes	Tyrannidae	<i>Myiophobus fasciatus</i>	MSB:Bird:36677	1.285	http://arctos.database.museum/guid/MSB:Bird:36677
Passeriformes	Tyrannidae	<i>Myiophobus fasciatus</i>	MSB:Bird:36706	1.264	http://arctos.database.museum/guid/MSB:Bird:36706
Passeriformes	Tyrannidae	<i>Myiozetetes similis</i>	MSB:Bird:37297	1.338	http://arctos.database.museum/guid/MSB:Bird:37297
Passeriformes	Tyrannidae	<i>Ochthoeca frontalis</i>	MSB:Bird:33980	1.320	http://arctos.database.museum/guid/MSB:Bird:33980
Passeriformes	Tyrannidae	<i>Ochthoeca frontalis</i>	MSB:Bird:34001	1.225	http://arctos.database.museum/guid/MSB:Bird:34001
Passeriformes	Tyrannidae	<i>Ochthoeca fumicolor</i>	MSB:Bird:34010	1.289	http://arctos.database.museum/guid/MSB:Bird:34010
Passeriformes	Tyrannidae	<i>Ochthoeca jelskii</i>	MSB:Bird:35116	1.318	http://arctos.database.museum/guid/MSB:Bird:35116
Passeriformes	Tyrannidae	<i>Ochthoeca jelskii</i>	MSB:Bird:35374	1.309	http://arctos.database.museum/guid/MSB:Bird:35374
Passeriformes	Tyrannidae	<i>Ochthoeca oenanthoides</i>	MSB:Bird:34130	1.260	http://arctos.database.museum/guid/MSB:Bird:34130
Passeriformes	Tyrannidae	<i>Ochthoeca oenanthoides</i>	MSB:Bird:34189	1.311	http://arctos.database.museum/guid/MSB:Bird:34189
Passeriformes	Tyrannidae	<i>Ochthoeca piurae</i>	MSB:Bird:35294	1.332	http://arctos.database.museum/guid/MSB:Bird:35294
Passeriformes	Tyrannidae	<i>Ochthoeca piurae</i>	MSB:Bird:35431	1.300	http://arctos.database.museum/guid/MSB:Bird:35431
Passeriformes	Tyrannidae	<i>Onychorhynchus coronatus</i>	MSB:Bird:37214	1.137	http://arctos.database.museum/guid/MSB:Bird:37214
Passeriformes	Tyrannidae	<i>Phaeomyias murina</i>	MSB:Bird:33676	1.265	http://arctos.database.museum/guid/MSB:Bird:33676
Passeriformes	Tyrannidae	<i>Phaeomyias murina</i>	MSB:Bird:33767	1.293	http://arctos.database.museum/guid/MSB:Bird:33767
Passeriformes	Tyrannidae	<i>Phaeomyias murina</i>	MSB:Bird:34754	1.299	http://arctos.database.museum/guid/MSB:Bird:34754
Passeriformes	Tyrannidae	<i>Phaeomyias murina</i>	MSB:Bird:35328	1.319	http://arctos.database.museum/guid/MSB:Bird:35328
Passeriformes	Tyrannidae	<i>Phyllomyias uropygialis</i>	MSB:Bird:35146	1.329	http://arctos.database.museum/guid/MSB:Bird:35146
Passeriformes	Tyrannidae	<i>Platyrrinchus flavigularis</i>	MSB:Bird:36363	1.144	http://arctos.database.museum/guid/MSB:Bird:36363
Passeriformes	Tyrannidae	<i>Platyrrinchus platyrhynchos</i>	MSB:Bird:37291	1.074	http://arctos.database.museum/guid/MSB:Bird:37291
Passeriformes	Tyrannidae	<i>Platyrrinchus platyrhynchos</i>	MSB:Bird:37292	1.190	http://arctos.database.museum/guid/MSB:Bird:37292

Passeriformes	Tyrannidae	<i>Polioxolmis rufipennis</i>	MSB:Bird:34169	1.281	http://arctos.database.museum/guid/MSB:Bird:34169
Passeriformes	Tyrannidae	<i>Polioxolmis rufipennis</i>	MSB:Bird:35995	1.201	http://arctos.database.museum/guid/MSB:Bird:35995
Passeriformes	Tyrannidae	<i>Pseudotriccus ruficeps</i>	MSB:Bird:32453	1.220	http://arctos.database.museum/guid/MSB:Bird:32453
Passeriformes	Tyrannidae	<i>Sayornis nigricans</i>	MSB:Bird:35894	1.260	http://arctos.database.museum/guid/MSB:Bird:35894
Passeriformes	Tyrannidae	<i>Tolmomyias poliocephalus</i>	MSB:Bird:36707	1.166	http://arctos.database.museum/guid/MSB:Bird:36707
Passeriformes	Tyrannidae	<i>Tyrannulus elatus</i>	MSB:Bird:37316	1.462	http://arctos.database.museum/guid/MSB:Bird:37316
Passeriformes	Tyrannidae	<i>Tyrannus melancholicus</i>	MSB:Bird:34677	1.298	http://arctos.database.museum/guid/MSB:Bird:34677
Passeriformes	Viduidae	<i>Vidua chalybeata</i>	MSB:Bird:30286	1.184	http://arctos.database.museum/guid/MSB:Bird:30286
Passeriformes	Viduidae	<i>Vidua chalybeata</i>	MSB:Bird:30287	1.141	http://arctos.database.museum/guid/MSB:Bird:30287
Passeriformes	Viduidae	<i>Vidua macroura</i>	MSB:Bird:30254	1.080	http://arctos.database.museum/guid/MSB:Bird:30254
Passeriformes	Viduidae	<i>Vidua paradisaea</i>	MSB:Bird:30256	1.166	http://arctos.database.museum/guid/MSB:Bird:30256
Passeriformes	Viduidae	<i>Vidua paradisaea</i>	MSB:Bird:30257	1.186	http://arctos.database.museum/guid/MSB:Bird:30257
Passeriformes	Vireonidae	<i>Cyclarhis gujanensis</i>	MSB:Bird:35149	1.415	http://arctos.database.museum/guid/MSB:Bird:35149
Passeriformes	Vireonidae	<i>Hylophilus ochraceiceps</i>	MSB:Bird:37147	1.241	http://arctos.database.museum/guid/MSB:Bird:37147
Passeriformes	Vireonidae	<i>Hylophilus ochraceiceps</i>	MSB:Bird:37148	1.269	http://arctos.database.museum/guid/MSB:Bird:37148
Passeriformes	Vireonidae	<i>Vireo olivaceus</i>	MSB:Bird:36827	1.236	http://arctos.database.museum/guid/MSB:Bird:36827
Passeriformes	Zosteropidae	<i>Zosterops pallidus</i>	MSB:Bird:30217	1.351	http://arctos.database.museum/guid/MSB:Bird:30217
Piciformes	Bucconidae	<i>Chelidoptera tenebrosa</i>	MSB:Bird:37070	1.304	http://arctos.database.museum/guid/MSB:Bird:37070
Piciformes	Bucconidae	<i>Chelidoptera tenebrosa</i>	MSB:Bird:37339	1.261	http://arctos.database.museum/guid/MSB:Bird:37339
Piciformes	Bucconidae	<i>Malacoptila fulvogularis</i>	MSB:Bird:36774	1.172	http://arctos.database.museum/guid/MSB:Bird:36774
Piciformes	Bucconidae	<i>Monasa morphoeus</i>	MSB:Bird:36923	1.238	http://arctos.database.museum/guid/MSB:Bird:36923
Piciformes	Bucconidae	<i>Nonnula ruficapilla</i>	MSB:Bird:36465	1.107	http://arctos.database.museum/guid/MSB:Bird:36465
Piciformes	Bucconidae	<i>Nonnula ruficapilla</i>	MSB:Bird:36503	1.115	http://arctos.database.museum/guid/MSB:Bird:36503
Piciformes	Bucconidae	<i>Nystalus chacuru</i>	MSB:Bird:35769	1.244	http://arctos.database.museum/guid/MSB:Bird:35769
Piciformes	Bucconidae	<i>Nystalus chacuru</i>	MSB:Bird:35770	1.283	http://arctos.database.museum/guid/MSB:Bird:35770
Piciformes	Bucconidae	<i>Nystalus chacuru</i>	MSB:Bird:35786	1.263	http://arctos.database.museum/guid/MSB:Bird:35786
Piciformes	Capitonidae	<i>Capito auratus</i>	MSB:Bird:36367	1.229	http://arctos.database.museum/guid/MSB:Bird:36367
Piciformes	Capitonidae	<i>Capito auratus</i>	MSB:Bird:37169	1.593	http://arctos.database.museum/guid/MSB:Bird:37169
Piciformes	Capitonidae	<i>Capito auratus</i>	MSB:Bird:37235	1.434	http://arctos.database.museum/guid/MSB:Bird:37235
Piciformes	Capitonidae	<i>Eubucco richardsoni</i>	MSB:Bird:36916	1.620	http://arctos.database.museum/guid/MSB:Bird:36916
Piciformes	Capitonidae	<i>Eubucco versicolor</i>	MSB:Bird:36204	1.599	http://arctos.database.museum/guid/MSB:Bird:36204
Piciformes	Capitonidae	<i>Eubucco versicolor</i>	MSB:Bird:36253	1.637	http://arctos.database.museum/guid/MSB:Bird:36253

Piciformes	Capitonidae	<i>Eubucco versicolor</i>	MSB:Bird:36661	1.550	http://arctos.database.museum/guid/MSB:Bird:36661
Piciformes	Galbulidae	<i>Galbula cyanescens</i>	MSB:Bird:27887	1.131	http://arctos.database.museum/guid/MSB:Bird:27887
Piciformes	Galbulidae	<i>Galbula cyanescens</i>	MSB:Bird:36611	1.100	http://arctos.database.museum/guid/MSB:Bird:36611
Piciformes	Galbulidae	<i>Galbula cyanescens</i>	MSB:Bird:36773	1.157	http://arctos.database.museum/guid/MSB:Bird:36773
Piciformes	Galbulidae	<i>Galbula cyanescens</i>	MSB:Bird:36790	1.126	http://arctos.database.museum/guid/MSB:Bird:36790
Piciformes	Indicatoridae	<i>Indicator minor</i>	MSB:Bird:30060	1.335	http://arctos.database.museum/guid/MSB:Bird:30060
Piciformes	Indicatoridae	<i>Indicator minor</i>	FMNH MLW3653	1.406	n/a
Piciformes	Indicatoridae	<i>Indicator minor</i>	MSB:Bird:30058	1.389	http://arctos.database.museum/guid/MSB:Bird:30058
Piciformes	Indicatoridae	<i>Indicator minor</i>	MSB:Bird:30059	1.369	http://arctos.database.museum/guid/MSB:Bird:30059
Piciformes	Indicatoridae	<i>Indicator minor</i>	MSB:Bird:30061	1.352	http://arctos.database.museum/guid/MSB:Bird:30061
Piciformes	Indicatoridae	<i>Indicator variegatus</i>	FMNH MLW3882	2.098	n/a
Piciformes	Indicatoridae	<i>Indicator variegatus</i>	FMNH MLW4130	1.997	n/a
Piciformes	Lybiidae	<i>Lybius torquatus</i>	FMNH MLW3421	1.753	n/a
Piciformes	Lybiidae	<i>Trachyphonus vaillantii</i>	FMNH MLW3406	1.711	n/a
Piciformes	Lybiidae	<i>Trachyphonus vaillantii</i>	MSB:Bird:30073	1.740	http://arctos.database.museum/guid/MSB:Bird:30073
Piciformes	Lybiidae	<i>Trachyphonus vaillantii</i>	MSB:Bird:30078	1.604	http://arctos.database.museum/guid/MSB:Bird:30078
Piciformes	Lybiidae	<i>Tricholaema leucomelas</i>	MSB:Bird:30331	1.615	http://arctos.database.museum/guid/MSB:Bird:30331
Piciformes	Lybiidae	<i>Tricholaema leucomelas</i>	MSB:Bird:30332	1.591	http://arctos.database.museum/guid/MSB:Bird:30332
Piciformes	Lybiidae	<i>Tricholaema leucomelas</i>	MSB:Bird:30333	1.548	http://arctos.database.museum/guid/MSB:Bird:30333
Piciformes	Picidae	<i>Campephilus haematogaster</i>	MSB:Bird:36897	1.508	http://arctos.database.museum/guid/MSB:Bird:36897
Piciformes	Picidae	<i>Campephilus rubricollis</i>	MSB:Bird:37087	1.389	http://arctos.database.museum/guid/MSB:Bird:37087
Piciformes	Picidae	<i>Campephilus rubricollis</i>	MSB:Bird:37314	1.394	http://arctos.database.museum/guid/MSB:Bird:37314
Piciformes	Picidae	<i>Campethera abingoni</i>	FMNH MLW3767	1.664	n/a
Piciformes	Picidae	<i>Campethera abingoni</i>	MSB:Bird:30075	1.560	http://arctos.database.museum/guid/MSB:Bird:30075
Piciformes	Picidae	<i>Campethera abingoni</i>	MSB:Bird:30076	1.472	http://arctos.database.museum/guid/MSB:Bird:30076
Piciformes	Picidae	<i>Colaptes atricollis</i>	MSB:Bird:35053	1.506	http://arctos.database.museum/guid/MSB:Bird:35053
Piciformes	Picidae	<i>Colaptes rivolii</i>	MSB:Bird:33958	1.542	http://arctos.database.museum/guid/MSB:Bird:33958
Piciformes	Picidae	<i>Colaptes rubiginosus</i>	MSB:Bird:33769	1.521	http://arctos.database.museum/guid/MSB:Bird:33769
Piciformes	Picidae	<i>Colaptes rubiginosus</i>	MSB:Bird:33789	1.549	http://arctos.database.museum/guid/MSB:Bird:33789
Piciformes	Picidae	<i>Colaptes rubiginosus</i>	MSB:Bird:33840	1.507	http://arctos.database.museum/guid/MSB:Bird:33840
Piciformes	Picidae	<i>Colaptes rubiginosus</i>	MSB:Bird:36155	1.573	http://arctos.database.museum/guid/MSB:Bird:36155

Piciformes	Picidae	<i>Colaptes rupicola</i>	MSB:Bird:34196	1.479	http://arctos.database.museum/guid/MSB:Bird:34196
Piciformes	Picidae	<i>Dryocopus lineatus</i>	MSB:Bird:37181	1.665	http://arctos.database.museum/guid/MSB:Bird:37181
Piciformes	Picidae	<i>Jynx ruficollis</i>	MSB:Bird:30350	1.312	http://arctos.database.museum/guid/MSB:Bird:30350
Piciformes	Picidae	<i>Melanerpes cruentatus</i>	MSB:Bird:36247	1.623	http://arctos.database.museum/guid/MSB:Bird:36247
Piciformes	Picidae	<i>Melanerpes cruentatus</i>	MSB:Bird:36356	1.634	http://arctos.database.museum/guid/MSB:Bird:36356
Piciformes	Picidae	<i>Melanerpes formicivorus</i>	MSB:Bird:30028	1.686	http://arctos.database.museum/guid/MSB:Bird:30028
Piciformes	Picidae	<i>Picoides dorsalis</i>	MSB:Bird:30035	1.328	http://arctos.database.museum/guid/MSB:Bird:30035
Piciformes	Picidae	<i>Picoides fumigatus</i>	MSB:Bird:34981	1.471	http://arctos.database.museum/guid/MSB:Bird:34981
Piciformes	Picidae	<i>Picoides fumigatus</i>	MSB:Bird:35124	1.480	http://arctos.database.museum/guid/MSB:Bird:35124
Piciformes	Picidae	<i>Picoides nuttallii</i>	MSB:Bird:29213	1.509	http://arctos.database.museum/guid/MSB:Bird:29213
Piciformes	Picidae	<i>Picoides villosus</i>	MSB:Bird:30517	1.378	http://arctos.database.museum/guid/MSB:Bird:30517
Piciformes	Picidae	<i>Picumnus subtilis</i>	MSB:Bird:36621	1.564	http://arctos.database.museum/guid/MSB:Bird:36621
Piciformes	Picidae	<i>Picumnus subtilis</i>	MSB:Bird:36642	1.605	http://arctos.database.museum/guid/MSB:Bird:36642
Piciformes	Picidae	<i>Picumnus subtilis</i>	MSB:Bird:36643	1.570	http://arctos.database.museum/guid/MSB:Bird:36643
Piciformes	Picidae	<i>Picumnus subtilis</i>	MSB:Bird:36871	1.614	http://arctos.database.museum/guid/MSB:Bird:36871
Piciformes	Picidae	<i>Veniliornis callonotus</i>	MSB:Bird:33682	1.458	http://arctos.database.museum/guid/MSB:Bird:33682
Piciformes	Picidae	<i>Veniliornis callonotus</i>	MSB:Bird:33698	1.503	http://arctos.database.museum/guid/MSB:Bird:33698
Piciformes	Picidae	<i>Veniliornis callonotus</i>	MSB:Bird:33716	1.531	http://arctos.database.museum/guid/MSB:Bird:33716
Piciformes	Picidae	<i>Veniliornis callonotus</i>	MSB:Bird:33730	1.455	http://arctos.database.museum/guid/MSB:Bird:33730
Piciformes	Ramphastidae	<i>Aulacorhynchus derbianus</i>	MSB:Bird:36156	1.687	http://arctos.database.museum/guid/MSB:Bird:36156
Piciformes	Ramphastidae	<i>Aulacorhynchus prasinus</i>	MSB:Bird:36799	1.672	http://arctos.database.museum/guid/MSB:Bird:36799
Piciformes	Ramphastidae	<i>Pteroglossus azara</i>	MSB:Bird:36496	1.447	http://arctos.database.museum/guid/MSB:Bird:36496
Piciformes	Ramphastidae	<i>Pteroglossus azara</i>	MSB:Bird:36501	1.542	http://arctos.database.museum/guid/MSB:Bird:36501
Piciformes	Ramphastidae	<i>Pteroglossus beauharnaesii</i>	MSB:Bird:37298	1.433	http://arctos.database.museum/guid/MSB:Bird:37298
Piciformes	Ramphastidae	<i>Pteroglossus inscriptus</i>	MSB:Bird:37338	1.564	http://arctos.database.museum/guid/MSB:Bird:37338
Piciformes	Ramphastidae	<i>Ramphastos tucanus</i>	MSB:Bird:37102	1.573	http://arctos.database.museum/guid/MSB:Bird:37102
Piciformes	Ramphastidae	<i>Selenidera reinwardtii</i>	MSB:Bird:36295	1.588	http://arctos.database.museum/guid/MSB:Bird:36295
Piciformes	Ramphastidae	<i>Selenidera reinwardtii</i>	MSB:Bird:37046	1.598	http://arctos.database.museum/guid/MSB:Bird:37046
Piciformes	Ramphastidae	<i>Selenidera reinwardtii</i>	MSB:Bird:37303	1.515	http://arctos.database.museum/guid/MSB:Bird:37303
Piciformes	Ramphastidae	<i>Selenidera reinwardtii</i>	MSB:Bird:37304	1.531	http://arctos.database.museum/guid/MSB:Bird:37304
Podicipediformes	Podicipedidae	<i>Tachybaptus ruficollis</i>	MSB:Bird:30041	1.585	http://arctos.database.museum/guid/MSB:Bird:30041
Psittaciformes	Psittacidae	<i>Aratinga leucophthalma</i>	MSB:Bird:37307	1.466	http://arctos.database.museum/guid/MSB:Bird:37307

Psittaciformes	Psittacidae	<i>Aratinga mitrata</i>	MSB:Bird:35753	1.533	http://arctos.database.museum/guid/MSB:Bird:35753
Psittaciformes	Psittacidae	<i>Bolborhynchus lineola</i>	MSB:Bird:34605	1.434	http://arctos.database.museum/guid/MSB:Bird:34605
Psittaciformes	Psittacidae	<i>Bolborhynchus lineola</i>	MSB:Bird:34606	1.411	http://arctos.database.museum/guid/MSB:Bird:34606
Psittaciformes	Psittacidae	<i>Bolborhynchus orbyngnesius</i>	MSB:Bird:35320	1.515	http://arctos.database.museum/guid/MSB:Bird:35320
Psittaciformes	Psittacidae	<i>Brotogeris cyanoptera</i>	MSB:Bird:36482	1.334	http://arctos.database.museum/guid/MSB:Bird:36482
Psittaciformes	Psittacidae	<i>Forpus coelestis</i>	MSB:Bird:33690	1.519	http://arctos.database.museum/guid/MSB:Bird:33690
Psittaciformes	Psittacidae	<i>Forpus coelestis</i>	MSB:Bird:33748	1.560	http://arctos.database.museum/guid/MSB:Bird:33748
Psittaciformes	Psittacidae	<i>Pyrrhura roseifrons</i>	MSB:Bird:36342	1.405	http://arctos.database.museum/guid/MSB:Bird:36342
Psittaciformes	Psittacidae	<i>Pyrrhura roseifrons</i>	MSB:Bird:36492	1.384	http://arctos.database.museum/guid/MSB:Bird:36492
Strigiformes	Strigidae	<i>Glaucidium peruanum</i>	MSB:Bird:35444	1.551	http://arctos.database.museum/guid/MSB:Bird:35444
Strigiformes	Strigidae	<i>Glaucidium peruanum</i>	MSB:Bird:35487	1.547	http://arctos.database.museum/guid/MSB:Bird:35487
Strigiformes	Strigidae	<i>Megascops ingens</i>	MSB:Bird:32525	1.655	http://arctos.database.museum/guid/MSB:Bird:32525
Strigiformes	Strigidae	<i>Megascops koepckeae</i>	MSB:Bird:35144	1.542	http://arctos.database.museum/guid/MSB:Bird:35144
Strigiformes	Strigidae	<i>Megascops koepckeae</i>	MSB:Bird:35304	1.530	http://arctos.database.museum/guid/MSB:Bird:35304
Tinamiformes	Tinamidae	<i>Crypturellus obsoletus</i>	MSB:Bird:37037	1.350	http://arctos.database.museum/guid/MSB:Bird:37037
Tinamiformes	Tinamidae	<i>Eudromia elegans</i>	MSB:Bird:28915	1.241	http://arctos.database.museum/guid/MSB:Bird:28915
Trogoniformes	Trogonidae	<i>Trogon collaris</i>	MSB:Bird:36263	1.356	http://arctos.database.museum/guid/MSB:Bird:36263
Trogoniformes	Trogonidae	<i>Trogon collaris</i>	MSB:Bird:37319	1.465	http://arctos.database.museum/guid/MSB:Bird:37319

Table S2: Single variable models with genome size as the dependent variable.

model type	predictor variable	adj. R ²	df	p-value
PGLS	flight muscles	0.05	287	< 0.001
PGLS	heart index	0.049	287	< 0.001
PGLS	body mass	0.015	287	0.019
PGLS	wing loading	0.007	191	0.013
PGLS	hand-wing index	0.005	191	0.78
regression	flight muscles	0.12	287	< 0.001
regression	heart index	0.25	287	< 0.001
regression	body mass	0.33	287	< 0.001
regression	wing loading	0.25	191	< 0.001
regression	hand-wing index	0.03	191	0.01

Table S3: Sample sizes (number of species), means (of species means), 95% confidence intervals (of taxon means) and coefficients of variation for genome sizes of 76 families.

order	family	N	mean	95% CI	coefficient of variation
Tinamiformes	Tinamidae	2	1.30	(0.60, 1.99)	0.06
Galliformes	Phasianidae	3	1.22	(1.18, 1.26)	0.01
Podicipediformes	Podicipedidae	1	1.58	-	-
Columbiformes	Columbidae	7	1.43	(1.38, 1.48)	0.04
Cuculiformes	Cuculidae	5	1.40	(1.31, 1.50)	0.05
Caprimulgiformes	Caprimulgidae	4	1.37	(1.14, 1.60)	0.11
Apodiformes	-	47	1.18	(1.17, 1.20)	0.05
Apodiformes	Apodidae	4	1.23	(1.05, 1.40)	0.09
Apodiformes	Trochilidae	43	1.18	(1.16, 1.19)	0.04
Strigiformes	Strigidae	3	1.58	(1.42, 1.74)	0.04
Pelecaniformes	Scopidae	1	1.35	-	-
Pelecaniformes	Threskiornithidae	1	1.47	-	-
Charadriiformes	Charadriidae	1	1.67	-	-
Charadriiformes	Turnicidae	1	1.26	-	-
Coliiformes	Coliidae	2	1.50	(1.12, 1.87)	0.03
Accipitriformes	Accipitridae	1	1.55	-	-
Falconiformes	Falconidae	2	1.50	(0.60, 2.4)	0.07
Trogoniformes	Trogonidae	1	1.41	-	-
Coraciiformes	-	9	1.37	(1.26, 1.48)	0.10
Coraciiformes	Phoeniculidae	2	1.22	(0.01, 2.43)	0.11
Coraciiformes	Upupidae	1	1.28	-	-
Coraciiformes	Coraciidae	1	1.28	-	-
Coraciiformes	Meropidae	2	1.35	(1.03, 1.66)	0.03
Coraciiformes	Alcedinidae	1	1.58	-	-
Coraciiformes	Momotidae	2	1.51	(1.38, 1.64)	0.01
Piciformes	-	38	1.50	(1.43, 1.56)	0.12
Piciformes	Lybiidae	3	1.67	(1.46, 1.88)	0.05
Piciformes	Bucconidae	5	1.21	(1.13, 1.30)	0.06
Piciformes	Galbulidae	1	1.13	-	-
Piciformes	Capitonidae	3	1.54	(1.27, 1.82)	0.07

Piciformes	Ramphastidae	7	1.57	(1.49, 1.65)	0.06
Piciformes	Picidae	17	1.51	(1.45, 1.56)	0.07
Piciformes	Indicatoridae	2	1.71	(-2.53, 5.96)	0.28
Psittaciformes	Psittacidae	7	1.46	(1.39, 1.53)	0.05
Passeriformes	-	286	1.31	(1.30, 1.32)	0.08
Passeriformes	Thamnophilidae	21	1.36	(1.34, 1.40)	0.05
Passeriformes	Furnariidae	30	1.29	(1.26, 1.32)	0.06
Passeriformes	Formicariidae	1	1.28	-	-
Passeriformes	Grallariidae	3	1.37	(1.18, 1.55)	0.05
Passeriformes	Tyrannidae	47	1.25	(1.23, 1.28)	0.06
Passeriformes	Conopophagidae	1	1.45	-	-
Passeriformes	Pipridae	6	1.23	(1.20, 1.25)	0.02
Passeriformes	Cotingidae	7	1.42	(1.29, 1.56)	0.10
Passeriformes	Tityridae	5	1.30	(1.26, 1.35)	0.03
Passeriformes	Hirundinidae	5	1.40	(1.35, 1.45)	0.03
Passeriformes	Vireonidae	3	1.30	(1.06, 1.55)	0.08
Passeriformes	Laniidae	3	1.22	(1.11, 1.34)	0.04
Passeriformes	Malaconotidae	3	1.22	(1.07, 1.37)	0.05
Passeriformes	Ptiliognatidae	1	1.83	-	-
Passeriformes	Paridae	2	1.26	(0.58, 1.94)	0.06
Passeriformes	Turdidae	7	1.43	(1.33, 1.52)	0.07
Passeriformes	Cinclidae	1	1.28	-	-
Passeriformes	Troglodytidae	5	1.32	(1.23, 1.40)	0.05
Passeriformes	Mimidae	1	1.32	-	-
Passeriformes	Polioptilidae	1	1.25	-	-
Passeriformes	Cisticolidae	8	1.17	(1.11, 1.23)	0.06
Passeriformes	Alaudidae	1	1.25	-	-
Passeriformes	Muscicapidae	8	1.32	(1.24, 1.38)	0.07
Passeriformes	Stenostiridae	1	1.23	-	-
Passeriformes	Platysteiridae	1	1.32	-	-
Passeriformes	Sylviidae	4	1.31	(1.19, 1.42)	0.03
Passeriformes	Macrosphenidae	1	1.31	-	-
Passeriformes	Acrocephalidae	2	1.31	(1.03, 1.59)	0.02
Passeriformes	Motacillidae	5	1.22	(1.09, 1.35)	0.09

Passeriformes	Ploceidae	9	1.25	(1.16, 1.34)	0.09
Passeriformes	Dicruridae	1	1.13	-	-
Passeriformes	Pycnonotidae	1	1.21	-	-
Passeriformes	Sturnidae	1	1.22	-	-
Passeriformes	Zosteropidae	1	1.35	-	-
Passeriformes	Passeridae	2	1.31	(1.31, 1.32)	0.00
Passeriformes	Viduidae	3	1.14	(1.01, 1.27)	0.05
Passeriformes	Estrildidae	8	1.33	(1.22, 1.44)	0.10
Passeriformes	Parulidae	7	1.43	(1.39, 1.47)	0.03
Passeriformes	Thraupidae	44	1.32	(1.30, 1.35)	0.06
Passeriformes	Cardinalidae	3	1.42	(1.26, 1.58)	0.05
Passeriformes	Passerellidae	11	1.42	(1.33, 1.51)	0.09
Passeriformes	Fringillidae	5	1.34	(1.20, 1.48)	0.08
Passeriformes	Emberizidae	2	1.32	(0.51, 2.12)	0.07
Passeriformes	Icteridae	4	1.40	(1.26, 1.55)	0.07

Supplemental Materials References

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