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SUPPLEMENTARY ONLINE MATERIAL FOR

**Pleistocene non-passeriform landbirds from Shiriya,
northeast Japan**

Junya Watanabe, Hiroshige Matsuoka, and Yoshikazu Hasegawa

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Supplementary Online Material

SOM. List of comparative materials examined; specimens are listed by species/subspecies and then geographic regions.

SOM. List of comparative materials examined; specimens are listed by species/subspecies and then geographic regions. Sex composition and number of partial skeletons are given in parentheses (m, male; f, female, u, unsexed; p, partial skeleton).

Phasianidae.—*Rollulus rouloul*: aviary, MVZ 59088 (m). *Arborophila brunneopectus*: Thailand, USNM 343998 (f). *Afropavo congensis*: aviary, USNM 430171 (m). *Pavo cristatus*: aviary, MVZ 179393, USNM 289970, 321837, UWBM 116856 (3 m, 1 f). *Argusianus argus*: Thailand, USNM 19471 (u); aviary, UWBM 85092 (f). *Polyplectron napoleonis*: aviary, USNM 621671, 621673, UWBM 82965 (2 m, 1 f). *Coturnix coturnix*: aviary, MVZ 136488 (m). *C. japonica*: Mongolia, UWBM 59843 (m); Korea, USNM 633328 (f); aviary, USNM 343450, 344514 (1 m, 1 f). *C. coromandelica*: aviary, MVZ 134780 (m). *Synoicus ypsilophorus*: New Guinea, USNM 53359 (m). *S. chinensis*: New Guinea, MVZ 149273 (m); Philippines, USNM 562143, 562145 (2 m). *Tetraogallus himalayensis*: aviary, USNM 430182, UWBM 65198 (1 m, 1 f). *Alectoris chukar*: Israel, USNM 605025, 605030 (2 f); aviary, MVZ 31125 (m). *Ammoperdix heyi*: Israel, USNM 605023 (f). *Perdix asiatica*: aviary, USNM 491899 (u). *Pternistis capensis*: South Africa, USNM 558454, 558460 (1 m, 1 f). *P. afer*: Zimbabwe, USNM 488838, 489335 (1 m, 1 f). *Francolinus pintadeanus*: Thailand, USNM 343198, 343199 (2 m). *Dendroperdix sephaena*: Tanzania, USNM 634713, 634721 (1 m, 1 f). *Peliperdix lathamii*: Cameroon, USNM 291780 (m). *Scleroptila levaillantii*: South Africa, USNM 489466 (m). *S. afra*: South Africa, UWBM 53131 (m). *Bambusicola thoracicus*: China, USNM 318518, 318741 (1 m, 1 f); Japan (introduced), MVZ 128713 (m). *B. sonorivox*: Taiwan, USNM 611819 (f). *Gallus gallus*: Indonesia, USNM 560790 (f); aviary, MVZ 12495, 45503 (2 u). *Lophophorus impejanus*: aviary, MVZ 137892, USNM 631757, 638632, UWBM 84421 (2 m, 2 f). *Tragopan temminckii*: aviary, USNM 491867, 621027 (1 m, 1 f). *T. caboti*: aviary, MVZ 45525, 53922 (2 f). *Ithaginis cruentus*: China, USNM 319182 (m); Tibet, USNM 319189 (f). *Pucrasia macrolopha*: aviary, UWBM 57088 (m). *Symaticus ellioti*: aviary, UWBM 33449, 82958 (2 m). *S. humiae*: aviary, USNM 615083, UWBM 82957 (2 m). *S. mikado*: aviary, USNM 346556, UWBM 58985 (1 m, 1 f). *S. soemmerringii*: aviary, MVZ 46111, 49764, USNM 292907, 292968, 344667 (3 m, 1 f, 1 u). *S. reevesii*: aviary, USNM 289572, 290302, 290303, 320867, 322767, 344402, 346350, 428249, 500369, 500710 (8 m, 3 f). *Chrysolophus pictus*: aviary, MVZ 138007, 136614, UWBM 119203 (3 m). *C. amherstiae*: aviary, UWBM 73867 (f). *Phasianus colchicus*: Korea, USNM 633483, 633485 (1 m, 1 f); California (introduced), MVZ 51673, 51673A, 68327, 84651, 133528, 135071, 156120, 176024 (4 m, 3 f). *Crossoptilon crossoptilon*: China, USNM 319197, 319200 (1 m, 1 u); aviary, USNM 554966 (f). *C. manchuricum*: aviary, MVZ 53980, USNM 320973 (1 m, 1 f). *C. auritum*: aviary, MVZ 137900 (m). *Catreus wallichii*: aviary, USNM 346852, 347598 (2 f). *Lophura swinhoii*: aviary, USNM 320294, 343428 (1 m, 1 f). *L. erythrophthalma*: aviary, MVZ 56240 (m). *Perdix perdix*: Canada, MVZ 140248, USNM 641454, 641462 (1 m, 2 f). *Meleagris gallopavo*: California, MVZ 183406, 183408, 183409 (2 m, 1 f); New York, USNM 556325 (f). *Bonasa umbellus*: Canada, MVZ 15546, 68068 (1 m, 1 f). *B. bonasia*: Siberia, USNM 557496, 557499 (1 m, 1 f). *Lagopus muta*: Sweden, USNM 620108 (m); Alaska, MVZ 137293 (f). *Dendragapus obscurus*: Nevada, MVZ 151729, 151733 (2 f); California, USNM 630803 (f). *Falcipennis falcipennis*: Primorye, USNM 622432 (f). *F. canadensis*: Canada, MVZ 63067 (f); Idaho, MVZ 61793 (m). *Lyrurus tetrix*: Kalininskaya, USNM 500266 (m). *Centrocercus urophasianus*: Montana, USNM

17707 (f); Nevada, MVZ 151737, 151739 (1 m, 1 f). *Tympanuchus phasianellus*: South Dakota, USNM 559925 (m). *T. pallidicinctus*: Kansas, MVZ 98474, 13175 (1 m, 1 f).

Columbidae.—*Columba livia*: California (introduced), MVZ 129295, 129298 (1 m, 1 f). *C. rupestris*: Korea, MVZ 135053 (m). *C. leuconota*: aviary, MVZ 30684 (f). *C. guinea*: aviary, MVZ 29113 (m). *C. palumbus*: France, MVZ 141896 (m). *C. arquatrix*: South Africa, MVZ 158703 (m). *Streptopelia orientalis*: Japan, MVZ 123361, 128741 (1 m, 1 f). *S. decaocto*: Korea, MVZ 142609, 142610 (1 m, 1 u). *S. semitorquata*: South Africa, MVZ 158704 (m). *S. capicola*: South Africa, MVZ 158705 (f). *Spilopelia chinensis*: Australia, MVZ 143413 (m); aviary, MVZ 41184. *S. senegalensis*: Botswana, MVZ 158706 (f); South Africa, MVZ 158707 (m). *Macropygia unchall*: locality unknown, MVZ 43622, 46152 (2 f). *M. phasianella*: Australia, MVZ 142187 (m); aviary, 54636 (m). *Ectopistes migratorius*: locality unknown, MVZ 84315 (u). *Patagioenas leucocephala*: aviary, MVZ 138015 (f). *P. plumbea*: Peru, MVZ 165113 (u). *P. fasciata*: California, MVZ 54522, 65175 (1 m, 1 f). *P. cayennensis*: Panama, MVZ 154938 (f). *P. flavirostris*: Mexico, MVZ 74760, 78703 (1 m, 1 f). *Starnoenas cyanocephala*: aviary, MVZ 41332 (f). *Geotrygon chrysis*: aviary, MVZ 45593 (f). *Leptotila verreauxi*: Mexico, MVZ 74761 (m); El Salvador, MVZ 85621 (f). *Zentrygon frenata*: Colombia, MVZ 141733 (m). *Zenaidura asiatica*: Arizona, MVZ 68837 (f); Mexico, MVZ 51073 (m). *Z. galapagoensis*: Galapagos, MVZ 140769, 140958 (1 m, 1 f). *Z. auriculata*: Colombia, MVZ 94080, 94081 (2 m). *Z. macroura*: Arizona, MVZ 151848 (f); Kansas, MVZ 65118 (m). *Z. graysoni*: aviary, MVZ 46606 (f). *Columbina inca*: Mexico, MVZ 74762, 153894 (1 m, 1 f). *C. picui*: Paraguay, MVZ 168806 (f); Bolivia, MVZ 141731 (f). *C. cruziana*: aviary, MVZ 74908 (f). *Claravis pretiosa*: El Salvador, MVZ 85615, 85616 (1 m, 1 f). *Henicophaps albifrons*: aviary, MVZ 44278, 46012 (1 f, 1 u). *Gallinolumba luzonica*: aviary, MVZ 47109, 53804 (1 m, 1 f). *G. rufigula*: aviary, MVZ 49759 (m). *Alopecoenas jobiensis*: aviary, MVZ 47105, 51344 (1 m, 1 u). *A. xanthonurus*: Mariana Islands, MVZ 115697 (m). *A. rubescens*: aviary, MVZ 44500, 46017 (2 f). *A. canifrons*: Palau Islands, MVZ 95122 (m). *A. stairi*: aviary, MVZ 51708 (m). *Leucosarcia melanoleuca*: Australia, UWBM 62821, 62938 (2 f). *Geophaps plumifera*: aviary, MVZ 136616, 136617 (1 m, 1 f). *Phaps chalcoptera*: Australia, MVZ 154306 (m); aviary, MVZ 53809 (f). *P. elegans*: aviary, MVZ 30693, 133589 (1 f, 1 u). *P. histrionica*: Australia, MVZ 141935 (m). *Ocyphaps lophotes*: Australia, MVZ 143420 (m); California, MVZ 88909 (f). *Geopelia striata*: Australia, MVZ 142189, 143414 (1 m, 1 f). *Otidiphaps nobilis*: aviary, MVZ 46124 (u). *Goura cristata*: aviary, MVZ 42673, 133590 (1 m, 1 f). *Didunculus strigirostris*: aviary, MVZ 27595 (f). *Turtur afer*: aviary, MVZ 40448 (f). *T. brehmeri*: Ghana, MVZ 164175 (f). *Oena capensis*: South Africa, MVZ 158709 (m). *Treron axillaris*: aviary, MVZ 27141 (m). *Ducula aenea*: aviary, MVZ 51705 (u). *D. pacifica*: Samoa, MVZ 65412, 65409 (u). *D. latrans*: Fiji, MVZ 51372, 51373 (1 m, 1 f). *D. bicolor*: aviary, MVZ 50566, 50570 (1 m, 1 f). *Megaloprepia magnifica*: New Guinea, MVZ 149287, 149288 (1 m, 1 f). *Chrysoena viridis*: Solomon Islands, MVZ 93619 (m). *Ptilinopus solomonensis*: Bismark Archipelago, MVZ 93389 (m). *P. ornatus*: New Guinea, MVZ 149284 (m). *P. perlatus*: New Guinea, MVZ 149285, 149286 (2 m). *P. insolitus*:

Bismark Archipelago, MVZ 93390 (f). *P. roseicapilla*: Marianas Islands, MVZ 115695 (f). *P. porphyraceus*: Samoa, MVZ 65418 (m). *Hemiphaga novaeseelandiae*: New Zealand, MVZ 80402 (f). *Lopholaimus antarcticus*: Australia, MVZ 154297 (f).

Apodidae.—*Cypseloides niger*: Alaska, MVZ 39795 (m); Washington, UWBM 19444, 21286, 33110, 91683 (3 m); Oregon, UWBM 59363 (f); Dominican Republic, USNM 290999 (m); locality unknown, UWBM 19444 (u). *Streptoprocne rutula*: Venezuela, USNM 614122 (m). *S. phelpsi*: Guyana, USNM 622775 (m). *S. zonaris*: El Salvador, MVZ 85724 (m); Colombia, MVZ 120732 (f). *S. semicollaris*: Mexico, MVZ 152986, USNM 489351 (1 m, 1 f). *Chaetura spinicaudus*: Guyana, USNM 637197 (f). *C. cinereiventris*: Costa Rica, MVZ 155742, 155743 (2 f). *C. vauxi*: Washington, UWBM 48231, 48232, 48237 (1 m, 2 f); Oregon, UWBM 42223 (m); California, MVZ 41027 (f); El Salvador, MVZ 85721 (m). *C. pelagica*: Florida, MVZ 53252–53256, 66685 (1 m, 5 f); Honduras, UWBM 32456 (u). *Hirundapus caudacutus*: Russia, UWBM 46916, 47128, 47230, 47231, 47345, 57445 (3 m, 3 f); Japan, USNM 500799, YIO 65584, 65584 (2 m, 1 f). *H. cochinchinensis*: Thailand, MVZ 156689 (u). *H. giganteus*: Thailand, MVZ 156688 (u). *Collocalia troglodytes*, Philippines, USNM 430517 (f). *C. esculenta*, Philippines, USNM 635376 (f); Solomon Islands, UWBM 63237, 63239 (2 f). *Aerodramus hirundinaceus*: Papua New Guinea, MVZ 149295 (f). *A. sawtelli*: Cook Islands, UWBM 42487, 42488, 42541–42543, 42565–42567 (2 m, 5 f, 1 u). *A. inquietus*: Pohnpei Island (Caroline Islands), USNM 431409 (m). *A. bartschi*: Mariana Islands, MVZ 95143 (f); Guam, MVZ 115703, 115704, 115713–115717 (5 m, 2 f). *A. spodiopygius*: Fiji, MVZ 51721–51723 (1 m, 1 f, 1 u); New Caledonia, USNM 561598 (m). *Aeronautes saxatalis saxatalis*: Washington, UWBM 40650, 42303, 54112, 54113, 55981, 55982 (4 m, 2 f); California, MVZ 41907, 77721–77723 (3 m, 1 f); Montana, MVZ 28986 (m); Arizona, UWBM 33227, 34155, 34156 (1 m, 1 f, 1 u). *Tachornis phoenicobia*: Dominican Republic, USNM 555775 (m). *T. squamata*: Guyana, USNM 621960 (m). *Panyptila cayennensis*: Panama, USNM 431346 (u); Brazil, USNM 321670 (u). *Cypsiurus parvus*: Alaska, MVZ 67569 (f); Gabon, USNM 64851 (f). *Tachymarpis melba*: Crete, USNM 559068 (u). *Apus pacificus*: Russia (ssp. *pacificus*), USNM 500258, UWBM 43827–43830, 44398, 44399, 46954–46956, 46958, 46959 (6 m, 6 f); Korea (ssp. *pacificus*), MVZ 148837 (m); Japan (ssp. *pacificus*?), YIO63553, 63946 (1 m, 1 f); Taiwan (ssp. *kanoi* or *kurodae*?), YIO 48 (f). *A. caffer*: South Africa, UWBM 53219 (m). *A. nipalensis*: Japan, YIO 63093 (u); Taiwan, USNM 611837 (m); Vietnam, USNM 431471, 431472 (2 m). *A. affinis*: Cameroon, USNM 292415, 292416 (1 m, 1 f); São Tomé, USNM 614156, 614157 (2 u); Gabon, USNM 642847, 642848 (2 m). *A. barbatus*: South Africa, UWBM 52770 (m). *A. apus*, Spain, UWBM 1962 (u); France, UWBM 32988 (u); Russia, UWBM 56587, 56589 (1 m, 1 f); China, NSMT AS Morioka Collection unnumbered (u).

Accipitridae.—*Pandion haliaetus* (Pandionidae): Indonesia, USNM 560783 (f). *Elanus caeruleus*: South Africa, USNM 558445, 558447 (2 f). *E. leucurus*: California, USNM 19603 (u). *Gampsonyx swainsonii*: Guyana, USNM 623084, 623110 (1 m, 1 f). *Leptodon cayanensis*: Panama, USNM 613953 (m). *Pernis ptilorhynchus*: Nepal, USNM 620644 (u); Thailand, USNM 343983 (m). *Aviceda subcristata*: Indonesia, USNM 558306 (f); Australia, USNM 620187 (f). *Polyboroides typus*: Zimbabwe, USNM 430434, 430435 (1 m, 1 f). *Gypohierax angolensis*: Angola, USNM 18892 (u); French

Congo, USNM 226143 (u). *Gypaetus barbatus*: Algeria, USNM 17834 (u); aviary, USNM 345684 (f). *Neophron percnopterus*: North Africa, USNM 17835 (u). *Spilornis cheela*: Thailand, USNM 19474, 343985 (1 m, 1 u). *Terathopius ecaudatus*: Tanzania, USNM 226900 634509 (m). *Pithecophaga jefferyi*: Philippines, USNM 226900 (u, composite); aviary, USNM 499879 (m). *Circaetus cinereus*: Zimbabwe, USNM 430776 (m). *Trigonoceps occipitalis*: aviary, USNM 320859, 347358 (1 f, 1 u). *Necrosyrtes monachus*: Sudan, USNM 291440, 291443 (1 m, 1 f). *Gyps himalayensis*: Kashmir, USNM 19534 (m). *Gyps africanus*: Zimbabwe, USNM 431591 (f). *Aegyptius monachus*: Spain, USNM 614152 (u); China, USNM 289569 (u). *Macheiramphus alcinus*: Malaysia, USNM 559816 (u). *Harpia harpyja*: Aviary, USNM 429223, 429721 (2 f). *Stephanoaetus coronatus*: aviary, USNM 345669, 346654 (1 m, 1 f). *Nisaetus cirrhatus*: aviary, USNM 344616 (m). *Aquila gurneyi*: Indonesia, USNM 554908 (u). *A. chrysaetos*: Tennessee, USNM 19394 (u). *A. audax*: Australia, USNM 620191, 620192 (1 m, 1 u). *A. verreauxii*: South Africa, USNM 612539 (u). *A. spilogaster*: Zimbabwe, USNM 430796, 490548 (1 m, 1 f). *Kaupifalco monogrammicus*: Liberia, USNM 347392, 347393 (1 m, 1 f). *Melierax metabates*: Zimbabwe, USNM 430326, 430381 (2 m). *Circus aeruginosus*: aviary, USNM 344419 (m). *C. cyaneus*: California, USNM 610734 (f); Maryland, USNM 291684 (m). *C. melanoleucos*: Russia, USNM 500257 (m). *Accipiter soloensis*: Indonesia, USNM 560782 (f). *A. nisus*: Sweden, USNM 610363, 610366 (1 m, 1 f); China, USNM 290308 (f). *A. gentilis*: Sweden, USNM 610353, 610358 (1 m, 1 f); Japan, USNM 499854 (u; p). *Haliaeetus leucogaster*: Indonesia, USNM 556992, 556993, 560784, 560785 (2 m, 2 f); aviary, YIO 60790 (m; p). *H. vocifer*: Tanzania, USNM 488146 (m); Sudan, USNM 291449, 291450 (2 f). *H. leucorhynchus*: locality unknown, USNM 612540 (u). *H. albicilla*: China, USNM 292774 (m); Korea, USNM 431363 (m); Japan, YIO 8974 (u; p); locality unknown, NSMT AS 578, 821, 874, 1197, NSMT PV 532, YIO 70778 (2 m, 3 u; 3 p). *H. leucocephalus*: Alaska, USNM 489276, 615007, 615009 (2 m, 1 f). *H. pelagicus*: Bering Island, USNM 17044 (u; p); Japan, YIO 8998, 8999 (1 m, 1 u; 2 p); aviary, YIO 9000, 15137 (1 m, 1 f; 2 p); locality unknown, NSMT AS 601, 620, 816, 1344, USNM 16959, YIO 70530 (6 u; 3 p). *Ichthyophaga ichthyaetus*: Sulawesi, USNM 224807 (m); aviary, USNM 468555 (u). *Haliaeetus sphenurus*: Australia, USNM 610563 (m). *H. indus*: Borneo, USNM 18759 (u); Indonesia, USNM 558303, 558304 (1 m, 1 f). *Milvus migrans*: Pakistan, USNM 557810 (f); Cameroon, USNM 291317 (m); China, USNM 292039, 319228, 319448 (1 m, 3 f). *Busarellus nigricollis*: Brazil, USNM 345772, 345773 (1 m, 1 f); aviary, USNM 431130 (f). *Geranospiza caerulescens*: Mexico, USNM 18450 (u); Brazil, USNM 345774 (m). *Butastur indicus*: Korea, USNM 18577 (u); Philippines, 611775 (f). *Ictinia plumbea*: Panama, USNM 613355, 613356 (2 m). *Buteo lagopus*: Sweden, USNM 610370 (f). *B. buteo*: China, USNM 292701, 318559–318561, 318739 (1 m, 2 f, 2 u).

Institutional abbreviations.—MVZ, Museum of Vertebrate Zoology, University of California, Berkeley, USA; NSMT AS, Avian Skeleton Collection, Department of Zoology, National Museum of Nature and Science, Tsukuba, Japan; NSMT PV, Vertebrate Paleontology Collection, Department of Geology and Paleontology, National Museum of Nature and Science, Tsukuba, Japan; USNM, Division of Birds, Department of Vertebrate Zoology, National Museum of Natural History, Smithsonian Institution, Washington, D.C., USA; UWBM, Ornithology Collection, Burke Museum of Natural History and Culture, University of Washington, Seattle, USA; YIO, Yamashina Institute for Ornithology, Abiko, Japan.