

Recognize new species *Phylloscopus tokaraensis* #88

The recent paper by Saitoh et al (2026) proposes that the Japanese endemic Ijima's Leaf Warbler *Phylloscopus ijimae* from the Izu Islands and the Tokara Leaf Warbler from the Tokara Islands consist of two species level taxa and describes the population from Tokara Islands as a new species *Phylloscopus tokaraensis*, sp. nov. in the supplementary material of the paper.

Although the morphological differences between the two are minimal, analyses of nuclear genome-wide and mitochondrial DNA reveals strong genetic divergence, and moreover, they clearly differ in vocalisation.

As described in the paper, "Ijima's Leaf Warbler *Phylloscopus ijimae* breeds in two Japanese archipelagos, separated by a distribution gap of ~1,000 km: the Izu Islands, southeast of Honshu, and the Tokara Islands, which are part of the Nansei Shoto or Ryukyu Islands, southwest of Kyushu.", with the latter population having been discovered in 1988.

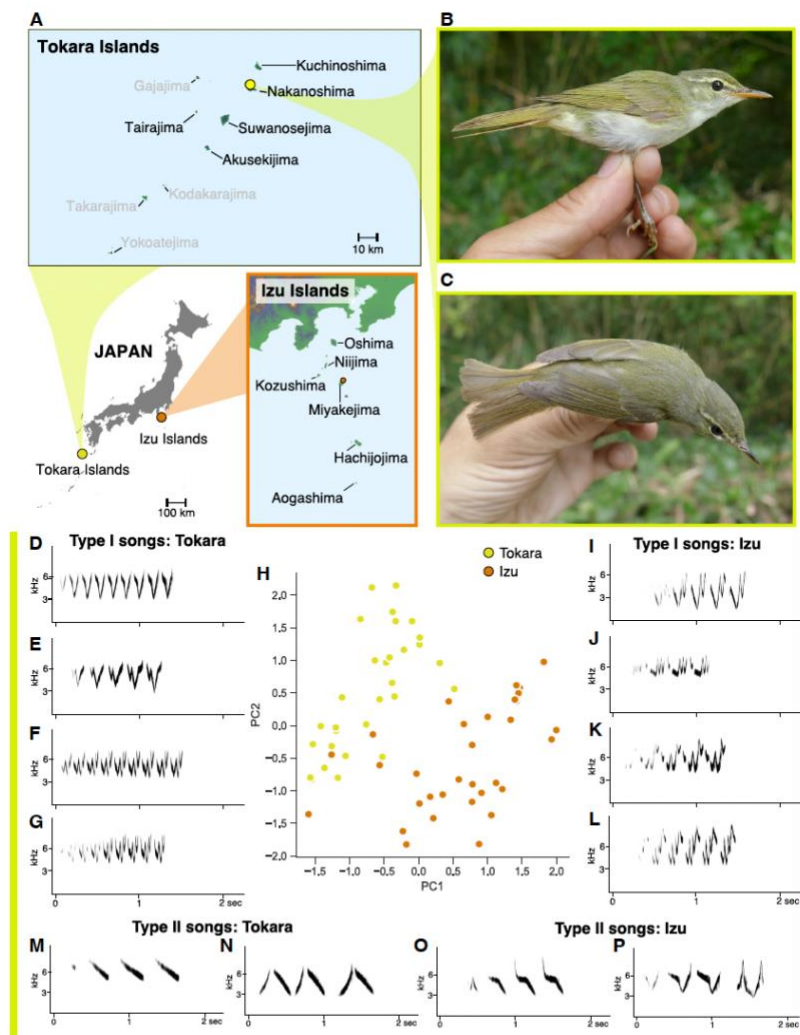


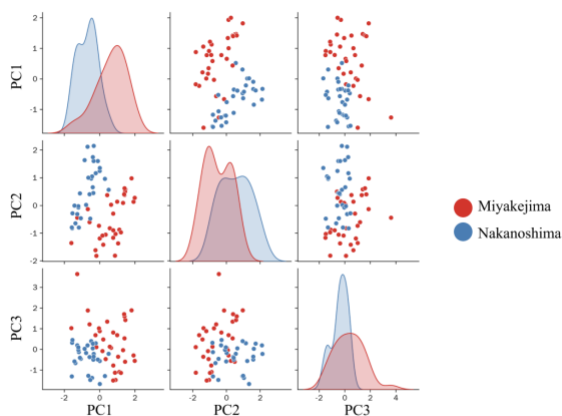
Fig. 1. Cryptic populations of *P. ijimae* are geographically separated by more than 1,000 km and have distinct songs. A) Global distribution of *P. ijimae*. Insets provide detailed maps of the Tokara Islands and northern Izu Islands (map source: Japan Aerospace Exploration Agency (2021), ALOS World 3D-30m DEM, V3.2, January 2021. Distributed by OpenTopography, <https://doi.org/10.5069/G94M92HB>, Accessed 2025 March 12). Island names in gray indicate locations where *P. ijimae* was not observed, while those in black indicate presence. B, C) Adult male, holotype of new species, Tokara Leaf Warbler (Yamashina Institute for Ornithology number YIO-76774), Nakanoshima, Tokara Islands, 2017 June 10 (photo: Per Alström; for additional photographs, see Table S18). Examples of single song strophes of type I songs from Tokara (D–G) and Izu (I–L), with a plot of the two PCs from a PCA based on 12 variables (H). Examples of single strophes of type II songs from Tokara (M and N) and Izu (O and P) (recordings: D: ML647192043; E: ML647191975; F: ML647192039; G: ML 647191951; M: 647192011; N: 647191965; all by P.A.; I: by T. Kabaya; J: ML647192103, by T.S.; K: XC749104; L: XC749102; O: XC749102), K, L, O by Geoff Carey; P: ML647356514, by Haruo Kuroda.

The two populations are morphologically cryptic:

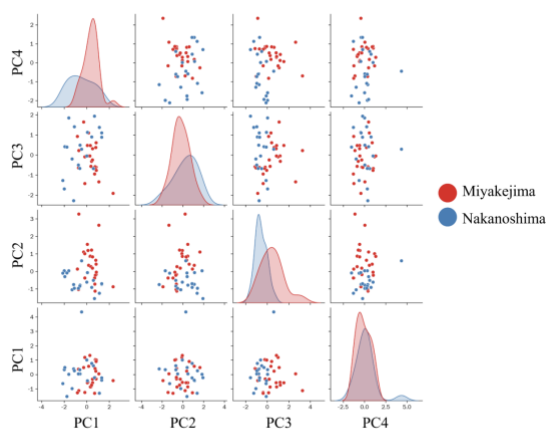
- No differences in plumage
- Undifferentiated in a PCA on five morphological measurements: natural wing length (wing chord; NW), tail length (TAIL), tarsus length (TAR), bill length (BL), and total head length (TH).
- But: significant differences in tarsus length and total head length, although ranges largely overlap

There are pronounced differences in song between the populations from Nakanoshima in the Tokara Islands (hereafter Tokara) and Miyakejima in the Izu Islands, with presence of two song types

- Separated clusters in type I song in a PCA of 12 song variables
- Discriminant function analysis of type I song classifies 100% of the recordings from Tokara and 97% of the ones from Izu correctly
- Although sample size of type II songs is small, there are significant differences between Tokara and Izu in a few variables, and a PCA of 12 song variables shows differences
- A discriminant function analysis of type II song classifies 90% of the recordings from Tokara and 92% of the ones from Izu correctly



SI Appendix Figure S3. Plot of three principal components from Principal Component Analysis of 12 Type I song variables.



SI Appendix Figure S4. Plot of four principal components from Principal Component Analysis of 12 Type II song variables.

Phylogenetic and population genomic analyses reveal deep split between the two populations

- Deep genetic divergence revealed by phylogenetic analyses of whole-genome autosomal SNPs, genome-wide introns and mtDNA

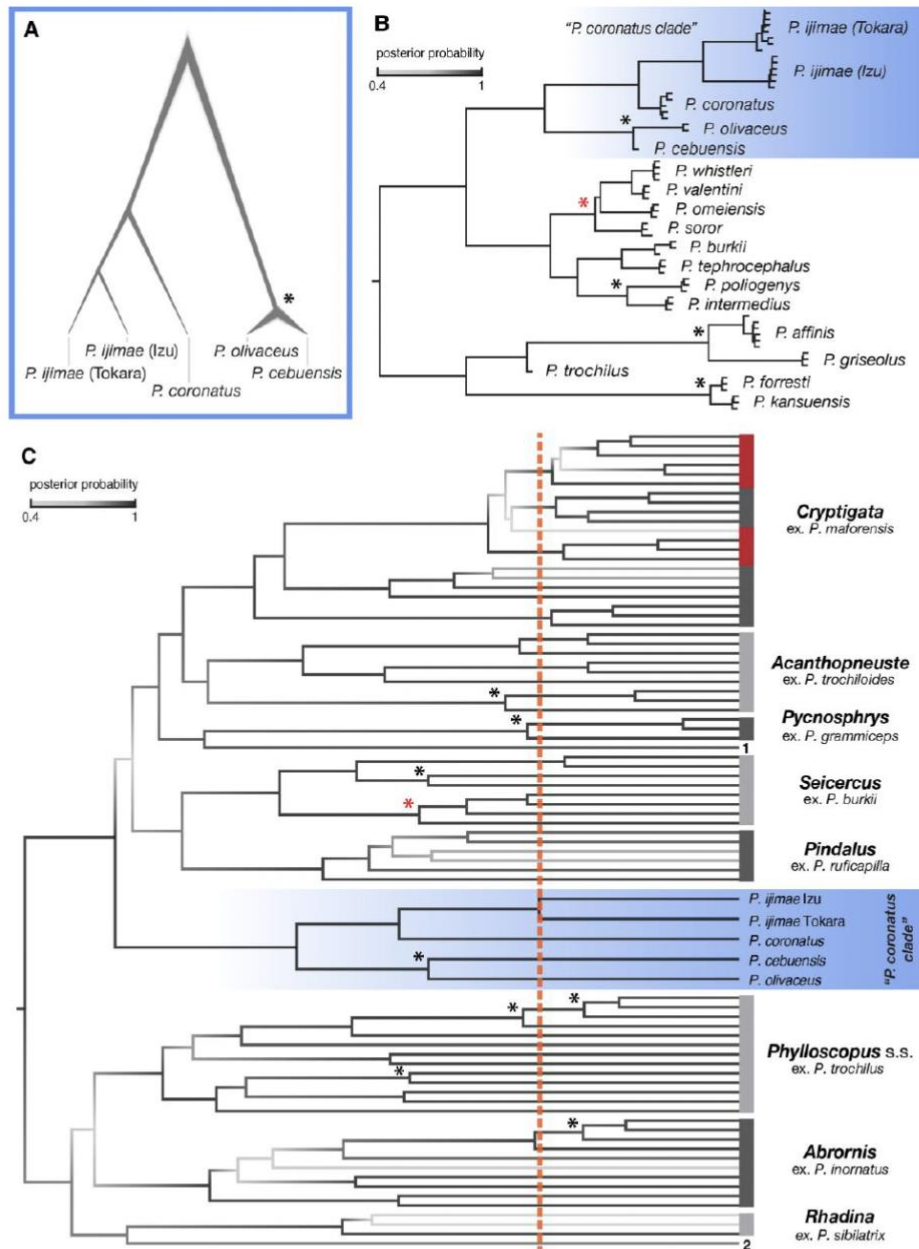


Fig. 2. Phylogenetic analyses suggest a deep divergence between the Tokara and Izu populations, on par with those between multiple closely related species of leaf warblers. A) Phylogenetic relationships and relative divergence within the “*P. coronatus* clade,” including the two populations of *P. ijimae*, based on 15,830 genome-wide SNPs analyzed under the multispecies coalescent (SNAPPER) and including all samples. B) Phylogenetic relationships and relative divergence within the “*P. coronatus* clade” and some other *Phylloscopus* clades in which up to five species are sympatric, based on ~7,100 introns analyzed under the multispecies coalescent (ATPW). C) Phylogenetic relationships and relative divergence among all species in the family Phylloscopidae based on the mitochondrial *cytb* gene (1,041 base pairs), inferred in BEAST2. Posterior probabilities are indicated as shades of black, the West Pacific archipelago species are indicated by a red bar, and the vertical dotted line indicates the separation between the two *P. ijimae* populations: (1) *Phylloscopus emeiensis* and (2) *Phylloscopus neglectus*; all species names are shown in Fig. S7. In all trees, sympatric species with divergence times comparable to or younger than the two *P. ijimae* populations are indicated by asterisks; the red asterisk at the *Seicercus* clade indicates that three of the species are sympatric on the same mountain but mainly or entirely elevationally segregated. The names in C are subgeneric names, following Alström et al. (10), with one example of a species in each subgenus.

- Population genetic analyses reveal no signs for recent or contemporary gene flow between the two populations and strong genetic divergence between them

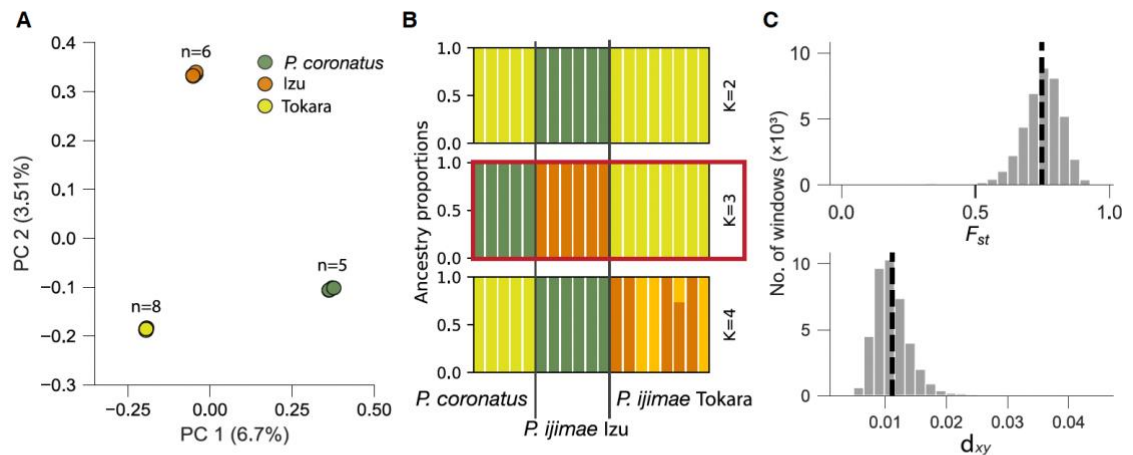


Fig. 3. Whole-genome analyses reveal distinct population structure and high divergence between *P. ijimae* populations. PCA (A) and ADMIXTURE (B) analysis of the two *P. ijimae* populations and their sister species *P. coronatus*. Color assignment on B is arbitrary. $K = 3$ had the lowest cross-validation error (highlighted by dark red rectangle, Fig. S12). C) Distributions of genomic differentiation (F_{ST}) and sequence divergence (d_{xy}) between Tokara and Izu populations. Dashed lines indicate mean values.

Based on this, the authors concluded “that the two Japanese island populations fulfil the requirements for being treated as separate species (under the “biological” [...], “phylogenetic” [...], as well as “unified” [...], species concepts.”

All members of the Palearctic RAG support the recognition of two species within Japanese endemic Ijima’s Leaf Warbler *Phylloscopus ijimae*: Ijima’s Leaf Warbler *Phylloscopus ijimae* from the Izu Islands and the Tokara Leaf Warbler from the Tokara *Phylloscopus tokaraensis*, sp. nov.

There is just one issue:

The new species is described in the Appendix, which has to be considered as a work independent from the paper itself, however, the Appendix has no date of publication. Hence, the description is not compliant with ICZN Art 8.5.2, and the new name in principle is not valid. However, according to Frank Rheindt “date issue with appendices and supplements is a huge grey zone that affects many animal names” and he adds that he does not consider this as problematic because „...so many names have been published by authors who considered the date in the main publication sufficient. The ICZN recognizes this and is not intent on making hundreds of legitimate names illegal.”

Reference

Saitoh, T., Shipilina, D., Xia, C., Zhang, L., Seki, S.-I., Olsson, U., Alström, P., 2026. Discovering and protecting cryptic biodiversity: A case study of a previously undescribed, vulnerable bird species in Japan. PNAS Nexus 5, pgag037. <https://doi.org/10.1093/pnasnexus/pgag037>

