

Why Reorganize Wood-warbler Taxonomy?

by Paul Hess

Irby Lovette, first author of a major phylogenetic revision of the family Parulidae published in 2010 (*Molecular Phylogenetics and Evolution* 57:753–770), recognizes that changes in species' classification and nomenclature may raise questions and perhaps criticism about the authors' proposed new names for various genera.

In an effort to anticipate and respond, Lovette has e-mailed a commentary to persons who raised questions about the suggested changes in nomenclature. Lovette, an associate professor in the Department of Ecology and Evolutionary Biology at Cornell University, has provided *Birding* with a copy of his responses written in September 2010.

The hypothetical DNA-based phylogeny is shown in the genealogical tree illustrated on p. 27-w3. It depicts placement of wood-warblers into revised groupings based on what the authors consider well-supported evolutionary relationships.

The revision distributes wood-warblers into 14 genera: *Seiurus*, *Helmitheros*, *Mniotilta*, *Limnothlypis*, *Protonotaria*, *Parkesia*, *Vermivora*, *Oreothlypis*, *Geothlypis*, *Setophaga*, *Myioborus*, *Cardellina*, *Basileuterus*, and *Myiothlypis*. Lovette notes that the recommended changes in genera are “fairly extensive, with some very well known names potentially disappearing.”

Missing are *Catharopeza*, *Dendroica*, *Ergaticus*, *Euthlypis*, *Leucopez*, *Oporornis*, *Parula*, *Phaeothlypis*, and *Wilsonia*, whose traditional names would be subsumed under names of new genera by standard rules of priority in nomenclature.

“Please keep in mind that these proposed name changes are at this point simply suggestions,” Lovette emphasizes. Responsibility for official nomenclature rests with the American Ornithologists' Union Committee on Classification and Nomenclature for North and Middle America and the South American Classification Committee.

“None of these revised names should be used in formal situations until approved by those committees,” Lovette says. He serves on the North and Middle American committee and is preparing a proposal for both committees. When that happens, he will recuse himself to avoid a conflict of interest. For a window onto how those committees work, he suggests reading overviews at the AOU websites: <aou.org/committees/nacc> and <tinyurl.com/4twk57n>.

The rest of Lovette's message responds to particular questions he expects to hear about the new nomenclature:

Why get rid of such well-established names? Lovette explains that the universally accepted rules of scientific nomenclature are fairly rigid. One principle is that earlier names have priority over names given later—basically, the first valid name given to an organism, or to a group of organisms, has precedence. So when choosing a genus name for a particular group of species, the earliest available genus name is conventionally given to any of those species. This is the approach the authors adopted.

When naming sets of species that have never before been placed together in a genus, Lovette notes that another approach is to make up a new genus name. “This, too, is a common and accepted practice, but we felt more comfortable using pre-existing names for Parulidae genera,” he says.

How do you feel personally about these name changes?

As a systematist and an ornithologist, Lovette fully accepts and supports them, but he adds, “At a more personal level I'm reconciled to them, while at the same time loathing the idea that some of my favorite genus names may disappear. *Dendroica* is the one that hits me the hardest. And as a person who struggles to memorize anything, I wish we had somehow figured out and stabilized all bird nomenclature long, long ago!”

***Parula* is one of the genera that you suggest should disappear. Does this mean the family name Parulidae will also change?**

“No, it stays Parulidae under any scenario. There is a modern, formal rule of nomenclature that decouples established family names from the genus names on which they are sometimes based.”

Why make these radical changes now? Lovette replies that the new paper presents a phylogeny, or “evolutionary tree,” that is in essence a hypothesis about relationships among the species in the family Parulidae. This tree allows evaluation of which wood-warbler species cluster together in natural groups. In the jargon of the discipline, such assemblages are

monophyletic groups or clades. His viewpoint is the following:

“I and most of my ornithologist colleagues feel that it is best to base genus and higher names (family, order, etc.) on these natural monophyletic groups. That way, each genus name refers to an evolutionarily distinct and clearly defined group of birds. This practice helps give the naming system a concrete biological foundation, and it encodes useful information: All of the species in a particular genus (or family or order) are more closely related to each other than they are to any other birds.

“In practice, however, we have often lacked the information needed to make well-informed evaluations of which birds fall within which groups. In the case of the wood-warblers, various studies going back several decades have suggested that the traditional taxonomy of the Parulidae recognizes many genera that do not meet this criterion of monophyly. A few such names have already been changed to reflect our increasingly better understanding of wood-warbler relationships, but before now we did not have a robust and well-sampled evolutionary tree of the entire family. Our paper presents such a tree, and given this new evidence we think this is an appropriate time to revise the taxonomy of the entire family.”

What evidence has prompted these name changes? “It is important to note that our genus name suggestions are based on the hypothesis that our evolutionary tree correctly depicts the history of the wood-warblers. All such phylogenies are simply hypotheses about the relationships of the organisms they include. And like all hypotheses, they can be supported or refuted as additional data accumulate,” Lovette points out.

The revised tree is based on what Lovette considers “for now a fairly robust dataset.” Most species in the family Parulidae are included, and the study offers DNA evidence from a suite of different genes.

But he adds, “Techniques are being developed for applying truly massive genetic datasets to addressing phylogenetic questions, and it will be interesting to see whether our phylogenetic hypothesis is supported as new data roll in. At this moment in the field of systematics, it is fairly simple to generate genetic datasets that make our warbler dataset look tiny—but frustratingly, we don’t yet have analytical tools that can readily handle such massive quantities of data.”

“More generally,” says Lovette, “to reduce the likelihood of future volatility in these genus names, we took what we believe to be a conservative approach, naming as separate genera only those groups of warblers with strong statistical support. In science it is always wise to be open to new information, but I will be surprised if new data radically alter our current warbler phylogeny hypothesis any time soon.”

Are any of the proposed name changes controversial?

Lovette replies, “Most of them are controversial in the sense that they alter well-established names, and many of us resist that level of disruption. At a scientific level, many of the name changes seem—at least to me—to be quite straightforward under the ever-present assumption that our phylogeny is a reliable guide to warbler relationships. There are a few places where there are two reasonable naming alternatives, where different people would likely draw the genus boundaries in slightly different places.”

Lovette adds, “I don’t personally feel strongly about any of these nuanced judgment calls, and I’ll be happy to let my colleagues on the check-list committees have the final say on their resolution.”

What about the English or other common names? Will those change too?

“I doubt that any common names will change as a result of this process, and I have no intention of proposing common name changes to the check-list committees,” he concludes.



The bibliographic reference for this paper is: Lovette, I. J., J. L. Pérez-Emán, J. Sullivan, R. C. Banks, I. Fiorentino, S. Córdoba-Córdoba, M. Echeverry-Galvis, F. K. Barker, K. Burns, J. Klicka, S. M. Lanyon, and E. Bermingham. 2010. A comprehensive multilocus phylogeny for the wood-warblers and a revised classification of the Parulidae (*Aves*). *Molecular Phylogenetics and Evolution* 57:753–770.



An abstract is available online <tinyurl.com/4u3dpvu>, and Lovette invites *Birding* readers to request an electronic reprint of the entire paper by e-mailing him <cj12@cornell.edu>. He also recommends an online perspective <tinyurl.com/28lrfff> as “a nicely balanced summary of these changes as interpreted by an ornithologist not involved in the Parulidae project.”

This is one of five different phylogenetic trees presented in the 2010 paper by Irby J. Lovette and coauthors to illustrate hypothetical evolutionary relationships among 107 wood-warbler species. It represents a so-called “maximum likelihood analysis” based on DNA divergence, which the authors recommend as a basis for future studies of the family Parulidae. The illustration, provided to *Birding* by courtesy of Lovette, is color-keyed for easier separation of the authors’ proposed genera.

The suggested classifications and nomenclature depart in many ways both from species groupings in the current “checklist order” and from long-familiar names of genera. Some species presently considered close relatives are separated distantly from each other. Some time-honored generic names disappear.

Revisions in classification include some particularly striking departures from species’ taxonomic past placement in genera.

Examples are:

- Ovenbird—placed in a monotypic genus of its own, *Seiurus*, which is presumed to be the first taxon to diverge from a lineage ancestral to all other wood-warblers studied by Lovette and colleagues.
- A major shuffling of species currently placed in the genus *Vermivora*. Bachman’s, Golden-winged, and Blue-winged warblers are retained in *Vermivora*, but six other *Vermivora* species are placed in the genus *Oreothlypis*, an older name that has been restored by Lovette and colleagues. The three species remaining in *Vermivora* are considered more closely related to the waterthrushes and Black-and-white, Prothonotary, and Swainson’s warblers.
- Kentucky, Connecticut, Mourning, and MacGillivray’s warblers—moved from their present genus *Oporornis* into the yellowthroat genus *Geothlypis*. By merging these two genera, Lovette and colleagues affirm an idea that had been floating around in the ornithological literature since the mid-1800s!
- Hooded Warbler—moved far from its current *Wilsonia* congeners, Wilson’s and Canada warblers, into the huge genus *Setophaga*.

Revisions in nomenclature of the proposed genera arise in several ways:

- By standard rules of priority, the first name given historically to any of a taxon’s members has precedence over names adopted later. For example, *Dendroica* warblers represent nearly all species in the proposed genus *Setophaga*, but the genus *Setophaga* is currently named for just one species, the American Redstart. The genus *Setophaga* was the first to be named (in 1827). *Dendroica*, *Parula*, *Wilsonia*, and *Catharopeza* were all named later in the 19th century.
- New nomenclature is necessary when, by rules of priority, a new genus cannot be named for any of its species. For example, a proposed new genus contains species from two previous genera, *Vermivora* and *Parula*. Priority would go to *Vermivora* because it was named first—but the name is retained elsewhere in the phylogeny. Thus, the authors needed a different name, and they selected *Oreothlypis* (“mountain bird”).
- Members of a single genus are split into two groups, which requires a new name for one of the new genera. *Basileuterus* is an example. This name is retained for one group, and the authors selected the new name *Myiothlypis* (“bird of the flies”), like *Oreothlypis* an older name restored by Lovette and colleagues

