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Announcing a new section: Provisional Identification Keys

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Abstract. Accurate species identification is essential for research, monitoring, human and animal health, agriculture, and conservation, yet it is often hindered by outdated or inaccessible identification keys and a limited number of trained taxonomists. Many experts maintain provisional keys that are actively used for identification but remain unpublished because these are not part of a taxonomic revision, lack illustrations, are incomplete, or are simply not sufficient to merit a stand-alone, peer-reviewed publication. To enable access to such keys, the Journal of Melittology introduces a new section, **Provisional Identification Keys**, dedicated to the dissemination of draft, preliminary, or provisional keys for bees. These contributions will be available online as clearly labeled working resources to facilitate identification, preserve expert knowledge, support training, facilitate and encourage collaborations and complement, rather than replace, formal, peer-reviewed taxonomic revisions. We will further clarify the nature of the complementarity in this introductory article.

INTRODUCTION

Accurate or reliable bee species identification is challenging, even in areas with well-known faunas. On one hand, species identification relies on detailed morphological features, which often require specialized knowledge and training. On the other hand, identification keys are nonexistent for many groups, or when available, are often outdated and not easily accessible to the broader community, making reliable species identification difficult or nearly impossible. For example, except for a few groups, keys to North American species of megachilid bees are over 60 years old and are largely outdated (Gonzalez *et al.*, 2013). A similar case occurs in the family Colletidae, for which nearly half of all species (>2700 spp.) lack published identification keys (Packer *et al.*, 2009).

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While the number of trained taxonomists is limited (Engel *et al.*, 2021), both scientific and societal interest in bees is increasing. The demand for accurate species identification continues to grow, creating a bottleneck that slows scientific progress and conservation efforts (Woodard *et al.*, 2020). Identification keys are typically produced during comprehensive taxonomic revisions, which depending on the group and the availability of material, may require between a few weeks to several decades of full-time research to complete (Packer *et al.*, 2009). Consequently, the time, effort, and expertise required to complete and publish a full revision often delay or prevent the formal publication of identification keys.

It is not uncommon for bee taxonomists or experienced users of identification keys to maintain working or provisional keys, sometimes modified and improved from earlier publications or developed for specific projects, collections, or regions. For the purpose of this article, “provisional” means available, perhaps as an earlier or later version in terms of completion and according to the author’s perspective, as a digital document (locally or online) but not published based on a peer-reviewed process. These provisional keys are often actively used, occasionally shared informally, and refined over time, yet they frequently remain unpublished and inaccessible to the broader community. For example, authors of this editorial have working keys to several groups, occasionally in the form of notes, annotations, and/or comments on existing keys, that may never be published because these are not part of a revision, lack illustrations, are incomplete, or are simply not sufficient to merit a standalone, peer-reviewed publication. However, making such working keys available would provide immediate, practical tools for the bee research community, helping to mitigate the identification bottleneck while more complete keys are eventually developed and published. It may also encourage feedback and their further development.

On the Utility of Provisional Keys

In view of the increasing need for identification tools, an incomplete but workable key is preferable to the best conceivable or most comprehensive key that may never be formally published and thus fails to address the current identification bottleneck. Traditional dichotomous keys, which have been used for more than 200 years, are often seen as fixed in time and place (Walter & Winterton, 2007); however, this is no longer the case with online publications that can be improved and updated (*i.e.*, versioned). Our community needs more dynamic and collaborative repositories for keys, as it has been identified for regional checklists (*e.g.*, Johnston *et al.*, 2018). To promote the transfer of taxonomic knowledge and to increase access to practical identification tools, the Journal of Melittology is pleased to announce a new section: **Provisional Identification Keys**.

This new section is intended as a venue for the dissemination of draft, preliminary, or provisional identification keys for bees. It may include keys that are geographically limited, taxonomically incomplete, modified or updated versions of previously published keys, or intended primarily for specialists and students. These acknowledged conditions can be explicitly stated, which will help the purpose. These contributions need not be associated with formal taxonomic revisions. Our goal is that the journal serves as a repository of these works to: 1) create a mechanism to pipeline for development of more formal keys; 2) facilitate identification and research across bee diversity; 3) preserve and share expert knowledge that might otherwise remain inaccessible; 4) support training and capacity building in bee taxonomy; and 5) complement, rather than replace, formal taxonomic revisions.

Review and Editorial Process

Working keys will be published as author-submitted documents, with a Digital Object Identifier (DOI), and without journal layout. Publishing working keys in this way will emphasize their provisional nature, facilitate rapid dissemination and revision, and clearly distinguish them from finalized taxonomic treatments published elsewhere in the journal. Each contribution will have a webpage within the journal and will be citable via its DOI. A recommended citation format will be provided on the publication page. The intent is to make these taxonomic tools discoverable, accessible, usable and citable, while clearly distinguishing them from finalized taxonomic treatments.

Contributions to this section will undergo editorial screening to ensure relevance, clarity, coherence, and appropriate scope, but they will not be subject to full peer review. All submissions will be explicitly labeled as *provisional* or *preliminary* resources, and authors will be encouraged to document known limitations and the intended scope of use. Authors may submit updated versions of their keys. Publication in this section will not preclude future formal publication of a revised or expanded key elsewhere. Instead, it will promote good version tracking, which is also a form of signaling (and hence attributing) credits for efforts leading to a new and improved version.

Anticipated Concerns

SCIENTIFIC STANDARDS. The absence of full peer review does not imply a lack of quality control. All submissions will be assessed by members of the editorial team for relevance, clarity, coherence, and overall usability. These contributions will not replace peer-reviewed taxonomic research; instead, they are explicitly labeled as provisional tools that may be improved or expanded through future research. Making such keys publicly accessible increases transparency and practical utility without changing standards for formal taxonomic publications. Each submission will also include required metadata to guarantee traceability and appropriate attribution. In this regard, working identification keys are comparable to the popular preprints currently hosted on several platforms across scientific disciplines (*e.g.*, Elmore, 2018; Fraser *et al.*, 2020), such as bioRxiv (<https://www.biorxiv.org/>) or repositories merged with publisher submission workflows like Authorea (<https://www.authorea.com/>).

PLAGIARISM AND PRIORITY. A potential concern is that provisional keys could be appropriated by others without proper attribution and/or author collaboration. However, in the balance of these concerns, we consider that publication through the journal makes these keys discoverable, accessible, citable, and clearly accredited to their authors. It will establish precedence while explicitly allowing future formal revisions and potential collaborative development. Engaged members of the bee research community may build upon these drafts by adding illustrations or photographs, and in collaboration with the original author, ultimately leading to a more complete and finalized identification tool (Fig. 1). In other words, we regard the publication of provisional keys as a timely opportunity for community recognition and collaboration to address the scientific and societal needs related to reliable bee species identification. We are prepared to take this step forward considering the envisioned benefits and acknowledged but manageable risks.

TAXONOMIC STABILITY AND NEW TAXA. Provisional identification keys will not include taxonomic changes or the formal establishment of new names. Such taxonomic actions must be submitted as part of a separate, peer-reviewed publication. Provisional keys are neither intended nor suited to serve as venues for nomenclatural acts or to replace formal descriptions. The inclusion or indication of putative new species within a key is asserted at the discretion of the author if the purpose is to alert the community

of undescribed diversity. In such cases, we encourage members of the bee research community to collaborate with the original author under mutually aligned terms toward the formal description of these taxa in a subsequent publication (Fig. 1).

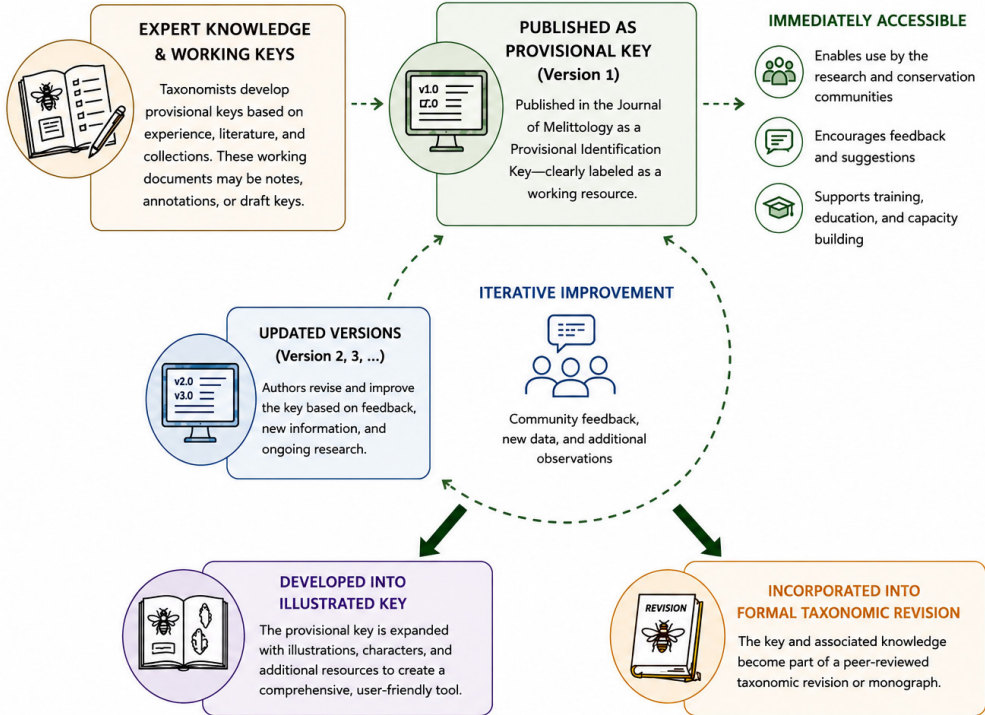


Figure 1. Conceptual framework for Provisional Identification Keys. Provisional keys capture expert knowledge and make it immediately accessible to the community, enabling use, feedback, and iterative improvement. Over time, these working tools may evolve into illustrated keys or incorporated into formal, peer-reviewed taxonomic revisions. Portions of this figure were developed with assistance from OpenAI’s ChatGPT (GPT-5.5) for conceptual visualization and graphic refinement, based on ideas and content developed by the authors.

An Example: *Augochloropsis* of Panama and Costa Rica

The opening contribution to this new section offers a provisional identification key to the species of the sweat bee genus *Augochloropsis* Cockerell occurring in Panama and Costa Rica (Andreola *et al.*, 2026). The key was developed while attempting to identify specimens from Costa Rica using material deposited in the Snow Entomological Museum at the University of Kansas. It illustrates the intended scope and structure of papers in this section by explicitly documenting the taxonomic and geographic scope of the key, intended users, known excluded taxa, known limitations, version history, citation format, and statement of status. It also includes standardized metadata clarifying that the work is provisional, versioned, and not intended to propose nomenclatural acts or taxonomic changes.

The *Augochloropsis* key further exemplifies how provisional contributions may incorporate photographs or any kind of illustrations, updated interpretations of previously published taxa, and references to putative undescribed species while remaining distinct from formal taxonomic revisions. In this case, one of the authors

(T.G.) recognizes additional undescribed taxa not treated in the present version of the key. The format of references and in-text citations follows the author guidelines of the Journal of Melittology (<https://journals.ku.edu/melittology/about/submissions>). A Word document provided as supplementary material may serve as a template for future contributions to this section.

Final Thoughts

Over the past year, the Journal of Melittology, in collaboration with the U.S. National Native Bee Monitoring Research and Coordination Network, published seven articles focused on advancing standardized and reproducible methods for the study of wild bees (Woodard & Levenson, 2025). These articles were published in response to a community need for greater standardization. The introduction of Provisional Identification Keys formalizes another widely recognized need within the community for useful resources for bee identification and aligns closely with the journal's mission to promote accessibility, training, and innovation in native bee research. The Journal of Melittology invites submissions to this new section and welcomes feedback from the community as we continue to develop and refine this resource.

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SUPPLEMENTAL MATERIAL

Template Word document with the required format, structure, and standardized metadata for contributions to the Provisional Identification Keys section.

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The logo features a stylized line drawing of a bee in flight, positioned to the left of the text. The letters 'JM' are rendered in a large, bold, serif font, with the bee's body and wings partially overlapping them. To the right of 'JM', the words 'Journal of Melittology' are written in a large, elegant, cursive script font.

Journal of Melittology

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The *Journal of Melittology* is an international, open access journal that seeks to rapidly disseminate the results of research conducted on bees (Apoidea: Anthophila) in their broadest sense. Our mission is to promote the understanding and conservation of wild and managed bees and to facilitate communication and collaboration among researchers and the public worldwide. The *Journal* covers all aspects of bee research including but not limited to: anatomy, behavioral ecology, biodiversity, biogeography, chemical ecology, comparative morphology, conservation, cultural aspects, cytogenetics, ecology, ethnobiology, history, identification (keys), invasion ecology, management, melittopalynology, molecular ecology, neurobiology, occurrence data, paleontology, parasitism, phenology, phylogeny, physiology, pollination biology, sociobiology, systematics, and taxonomy.

The *Journal of Melittology* was established at the University of Kansas through the efforts of Michael S. Engel, Victor H. Gonzalez, Ismael A. Hinojosa-Díaz, and Charles D. Michener in 2013 and each article is published as its own number, with issues appearing online as soon as they are ready. Papers are composed using Microsoft Word® and Adobe InDesign® in Lawrence, Kansas, USA.

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