

Towards improved taxonomic standards in Orthoptera: Critical examination of Cadena-Castañeda et al. (2025b) and proposed synonymies

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Abstract

Zootaxa recently published a monograph entitled “Studies on pygmy grasshoppers: On the current Metrodorinae sensu lato classification (Orthoptera, Tettigidae) with emphasis on American and Malagasy taxa” by Cadena-Castañeda et al. (2025b). This monograph represents the most expansive revision of Tettigidae taxonomy in recent history, spanning nearly 300 pages. Across South America and Madagascar, the authors describe two new subfamilies, seven new tribes, 12 new genera and 11 new species in their revision of the subfamily Metrodorinae. The revision of this subfamily is much needed and the monograph in question provides valuable data in the form of type specimen photographs. However, in this paper, we present numerous concerns regarding this revision, including factual

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errors, omissions of key information, questionable taxonomic decisions and inconsistently applied diagnostic characters. Most of the newly-described taxa lack any diagnostic information and their compositions, coupled with the provided data, do not allow for differentiation between taxa, prompting us to propose numerous taxonomic acts: *Platyettix* Hancock, 1906 **syn.** of *Metrodora* Bolívar, 1887; *Tylosettix* Morse, 1900 **syn.** of *Metrodora*; *Hebardidora* Cadena-Castañeda & Tavares, 2025, **syn. nov.** of *Metrodora*; *Bolivariidora* Cadena-Castañeda & Tavares, 2025, **syn. nov.** of *Metrodora*; *Morseidora* Cadena-Castañeda & Tavares, 2025, **syn. nov.** of *Armasius* Perez-Gelabert & Yong, 2014; *Armasius acutus* **comb. nov.** of *Metrodora acuta* Günther, 1939; *Metrodora mollilobata* Kasalo & Skejo, 2025, **stat. resurr.**; *Devrieseium* Cadena-Castañeda & Tavares, 2025, **syn. nov.** of *Chiriquia* Morse, 1900; *Stalitettix* Cadena-Castañeda & Tavares, 2025, **syn. nov.** of *Chiriquia*; *Garciaitettigini* Cadena-Castañeda & Tavares, 2025, **syn. nov.** of *Metrodorini* Bolívar, 1887; *Otumbini* Cadena-Castañeda & Tavares, 2025, **syn. nov.** of *Metrodorini*; *Tumbrinckitettix* Cadena-Castañeda & Tavares, 2025, **syn. nov.** of *Cryptotettix* Hancock, 1900; *Holocerus devriesei* Skejo, Medak, Pavlović, Kitonić, Miko & Franjević, 2020, **comb. rev.**

Key Words

Madagascar, Metrodorinae, Neotropics, revision, Tetrigidae

Introduction

Metrodorinae is a large subfamily of Tetrigidae (Orthoptera) that formally includes representatives from around the world (Cigliano et al. 2025). It is unanimously recognised as polyphyletic, but Asian genera without a clear taxonomic placement are grouped under an informal name “Asian Metrodorinae” (Pavón-Gonzalo et al. 2012; Kasalo et al. 2023; Luo et al. 2024; Skejo et al. 2024). Asia harbours approximately half of all known tetrigid species (Cigliano et al. 2025), which are often grouped into polyphyletic genera (Subedi and Kasalo 2023; Patano Jr et al. 2024; Skejo et al. 2024). This means that it is often required to examine a large number of scattered taxa before a robust diagnosis of a tribe or a subfamily can be established. Consequently, the “Asian Metrodorinae” group is used as a placeholder, while studies on its constituents are carried out.

The fact that Metrodorinae need a revision is perhaps the most well-known problem in the field of tetrigidology. Indeed, many studies (particularly concerning “Asian Metrodorinae”), are currently being conducted by a considerable number of authors of this paper. The monograph published in 2025 by Cadena-Castañeda et al. on the classification of the Metrodorinae, therefore, was very much needed and welcome and we do not take issue with the topic of the monograph itself, but rather with the methodological approach employed in this revision. Taxonomy, particularly higher taxonomy, requires substantial time and effort to produce taxon definitions that facilitate rather than impede future research. Unfortunately, we find that the monograph under discussion may hinder progress and complicate future studies on Tetrigidae globally.

We note a parallel with criticism Rehn (1952) pronounced against the revisions Günther published (Günther 1938a, 1938b, 1939). In a paragraph of the monograph on the Australian Acrididea, he wrote:

In more recent years Dr. Klaus Günther has presented three instalments of a new systematic study of the Tetrigidae, these scattered in different publica-

tions, with their continuation probably prevented by war conditions. While a large number of new genera have been described in these papers and a very great amount of revision has been attempted, including the realignment of many elements, the whole is very sketchily presented, sometimes contradictory and in many aspects premature and in a large number of cases, sweeping conclusions are expressed without the benefit of any original material of the genera or species that have been juggled about. The real value of certain of Günther's conclusions is often obscured by the assertive bumptiousness with which the work of others has been treated and in a large number of cases he has created synonymy without knowledge of the original, or any other, material of the elements thrown into the discard. [...] While Günther has given us a great deal of constructive information, he has also put forth a very high percentage of erroneous and hasty conclusions, which will require much work in the future to undo and correct. (Rehn 1952: 19).

Our concerns regarding the work of Cadena-Castañeda et al. (2025b), subsequently referred to as “the monograph”, are similar in nature, although it should be noted that Günther based his analysis on substantial new material, provided clear generic diagnoses and did not introduce numerous new suprageneric taxa. We present arguments that Cadena-Castañeda et al. (2025b), in their attempt to resolve all remaining issues with South American and Malagasy Metrodorinae simultaneously, described new subfamilies and tribes without sufficient analysis. Furthermore, we find the method of defining suprageneric taxa in this monograph problematic, as it relies on overly detailed descriptions that often contradict the examined material and fail to adequately highlight diagnostic characters that distinguish these taxa from related groups. These concerns will be elaborated below.

The monograph states two aims: (i) to propose classification adjustments of Metrodorinae (in the Neotropics and Madagascar) and (ii) to discuss the classification proposals

of Kasalo et al. (2023), both of which will be examined here in detail. This paper is structured to thematically group various identified issues. We conclude with a summary of the main points and propose potential solutions. To maintain clarity, throughout this text we refer to taxa using the names proposed in the monograph, even where we question their validity. In the Results section, we provide taxonomic acts that we suggest as a tentative solution, accompanied by brief justifications which are further developed in the Discussion.

Materials and methods

In this paper, we provide a detailed re-examination of the data presented in the monograph by Cadena-Castañeda et al. (2025b). To establish the taxonomic identity of groups at all levels, we examined the relevant type specimens available in the Orthoptera Species File (OSF) (Cigliano et al. 2025) and compared them to the type specimens of the groups proposed in the monograph.

Since the monograph uses multiple identification keys in place of formal diagnoses, we manually reconstructed the intended diagnoses for the *Metrodorina* genera and species. To do this, for each genus and species, we constructed the chain of characters leading from the first entry in the key all the way down to the final set of characters that describe the genus and species itself. In other words, these reconstructed diagnoses include all the character states that have to be observable in order to enable the user of the key to correctly navigate to a given genus. To approximate the level of consistency of the key, within each genus, we counted the number of character states that fit the intended diagnosis and divided it by the total number of character states for the genus. The same approach of diagnosis reconstruction was used to identify the taxonomically relevant characters at other levels in other keys.

We re-assessed the monograph's interpretation of morphological characters used to erect new taxa and proposed synonymies in cases where we found those characters unable to be applied in the diagnosis of the proposed taxa. Each taxonomic act is explained in the Results section, with the Discussion section containing further clarification of systemic issues affecting the reliability of the groups described in the monograph. This paper contains extensive quotations from published works. All direct quotations were reproduced faithfully and are presented either in double quotation marks when embedded in the text or as italicized block quotations when long. Any annotations added by the authors are enclosed in square brackets.

Results

Neotropical *Metrodorinae*

The monograph lacks formal diagnoses, which makes it impossible to comment on the definitions of taxa out-

right. To compare the composition of a given taxon to its definition, we reconstructed the intended diagnoses by using the keys to trace the characters leading to a given taxon. Fig. 1 provides a summary of how species previously assigned to *Metrodora* conform to the diagnostic characters specified in the key to *Metrodorina* genera. All characters leading to any genus in the key were recorded and marked green whenever observed in a given species, red whenever not observed and yellow whenever the character state could not be clearly assessed.

On average, approximately 70% of character states assigned to a genus were found to be unambiguous, with others being either absent or ambiguous in the species of that genus. This percentage varies considerably: 92% of entries are consistent for *Platyettix* species, whereas only around 50% are consistent for *Metrodora*, *Hebardidora* and *Tylotettix* species. This analysis demonstrates that the descriptions in the key do not consistently reflect the morphologies of the species whose identification the key is intended to facilitate. This assessment does not determine whether correctly described characters actually delimit genera (see Discussion).

There are three things to note here. First, *Metrodora colombiae* Günther, 1939 was not treated in the monograph.

Second, we found some of the characters insufficiently defined to be used in diagnosing taxa. For example, we considered the definition of the character concerning the width and length of the infrascapular area impractical because we found it to be very difficult to accurately evaluate from the presented photographs and to vary strongly within genera as they are currently defined. Another example is the scutellum width, which was not defined in relation to any other character, for example to the width of the antennal groove. When coding our table (Fig. 1), we adopted a conservative interpretation, interpreting “wide scutellum” as “noticeably wider than the antennal groove” and “narrow scutellum” as “approximately as wide as the antennal groove or narrower”. However, for *Metrodora*, the key in the monograph states “scutellum almost narrow”. We found it very difficult to interpret the statement of “almost narrow”, as it blurs the difference between the “narrow” and “wide” states. In fact, in *Metrodora rana* Bolívar, 1887 (the only species assigned to *Metrodora* in the monograph), this character resembles the state found in *P. uniformis*, *H. kasalo* and *T. simplex*, all of which are characterised in the monograph as having a wide scutellum, but which should actually be considered narrow by any consistent definition. Yet another example is the character “anterior margin of pronotum rounded”. Many species lack dorsal photographs; hence, it is unclear how species with only holotypes available were coded for this character. It cannot be coded from lateral photos as the anterior margin can also be pointed as in *Bolivariidora parisae* Cadena-Castañeda & Tavares, 2025, which would look rounded in the lateral view.

The third and, in our view, most important observation is that we found virtually none of the genera to consistently satisfy all proposed diagnostic characters. Based on our re-examination, nearly every genus contains a few species that do not conform to the diagnosis

	BOLIVARIDORA					MORSEIDORA	TYLOTETTIX			HEBARDIDORA			PLATYTETTIX					METRODORA	
	paraensis	tani	lucosa	cipolai	parisae	acuta	sinuata	simplex	pygmaea	harroweri	panamae	kasaloi	reticulatus	gibbosulus	arcuatus	gibbinotus	uniformis	pilosus	rana
BOLIVARIDORA																			
Carinae of the vertex produced, conspicuously protruding in the middle of the eyes in lateral view.																			
Body smooth or with small granulations.																			
Pronotum with or without crest; if present, located mainly in the anterior section of the pronotal disc.																			
Median carinae sub-elevated or not elevated; therefore, the pronotal disc is mostly flat.																			
Scutellum narrow.																			
Lateral lobes of the pronotum with the lower margin pointed.																			
Apex of the pronotum unmodified.																			
MORSEIDORA																			
Carinae of the vertex produced, conspicuously protruding in the middle of the eyes in lateral view.																			
Body smooth or with small granulations.																			
Pronotum with or without crest; if present, located mainly in the anterior section of the pronotal disc.																			
Median carinae elevated, and configured in different shape, such as a hump or a continuous crest.																			
Scutellum mostly wide.																			
Anterior margin of pronotum slightly projected over the head, hook-like. Crest formed by the elevated and moderately flattened laterally median carina, projecting to the apex of the pronotal disc, which exceeds the apex of the abdomen.																			

Figure 1. Visual summary of how each diagnostic character proposed for *Metrodora* s.l. species fits with their actual states. Green signifies that the character state could be observed in a given species, red that it could not and yellow that it was unclear. *Hebardidora panamae* lacks photographs in the monograph, so we did not attempt to code it.

given in the monograph and, in some cases—particularly *Hebardidora* and *Tylosettix*—the majority of included species fail to conform to proposed characters. Combined with the diagnostic issues documented below, we found it largely impossible to reliably apply the keys to identify the species included in the corresponding genera.

We found the newly-proposed generic and suprageneric taxa to lack morphological consistency and to be accompanied by contradictory (or missing) diagnoses. This undermines the usability of the taxonomic system proposed in the monograph until extensive revisions are undertaken. Therefore, as an interim measure, we propose a tentative solution by synonymising taxa lacking meaningful differentiating characters in their definitions. While some taxa

may later be validated through diligent research, this approach prioritises clarity and taxonomic stability.

First, we deal with an unsupported synonymisation of a *Metrodora* species. Since the publication of the monograph, another short paper was published by Cadena-Castañeda et al. (2025a) in which they synonymised two *Metrodora* species published by Kasalo et al. (2025), which was published days after the publication of the monograph. Cadena-Castañeda et al. (2025a) proposed the Synonymization of *Metrodora ala* Kasalo & Skejo, 2025 with *Hebardidora kasaloi*, which is justified since the type localities of these two species are relatively close to each other and no significant morphological differences between holotypes are apparent.

	BOLIVARIDORA					MORSEIDORA	TYLOTETTIX			HEBARDIDORA			PLATYTETTIX					METRODORA		
	paraensis	tani	lutosa	cipolai	parisae	acuta	sinuata	simplex	pygmaea	harroweri	panamae	kasaloji	reticulatus	gibbosulus	arcuatus	gibbinotus	uniformis	pilosus	rana	
TYLOTETTIX																				
Carinae of the vertex produced, conspicuously protruding in the middle of the eyes in lateral view.																				
Body smooth or with small granulations.																				
Pronotum with or without crest; if present, located mainly in the anterior section of the pronotal disc.																				
Median carinae elevated, and configured in different shape, such as a hump or a continuous crest.																				
Scutellum mostly wide.																				
Anterior margin of pronotum rounded.																				
Crest wavy, formed by the elevated wavy median carina.																				
Apex of the pronotum not or slightly exceeding the apex of the abdomen.																				
Median carina elevated of pronotum progressively curving from anterior margin to the apex.																				
Infrascapular area with medium width, reaching up to the fourth to sixth abdominal segment.																				
HEBARDIDORA																				
Carinae of the vertex produced, conspicuously protruding in the middle of the eyes in lateral view.																				
Body smooth or with small granulations.																				
Pronotum with or without crest; if present, located mainly in the anterior section of the pronotal disc.																				
Median carinae elevated, and configured in different shape, such as a hump or a continuous crest.																				
Scutellum mostly wide.																				
Anterior margin of pronotum rounded.																				
Crest wavy, formed by the elevated wavy median carina.																				
Apex of the pronotum not or slightly exceeding the apex of the abdomen.																				
Median carina elevated, generally with a conspicuous hump on the anterior section of the pronotum and a minor undulation from the central section to the apex.																				
Infrascapular area wide and more conspicuous than the previous genus, reaching up to the eighth or ninth abdominal segment.																				

Figure 1. Continued.

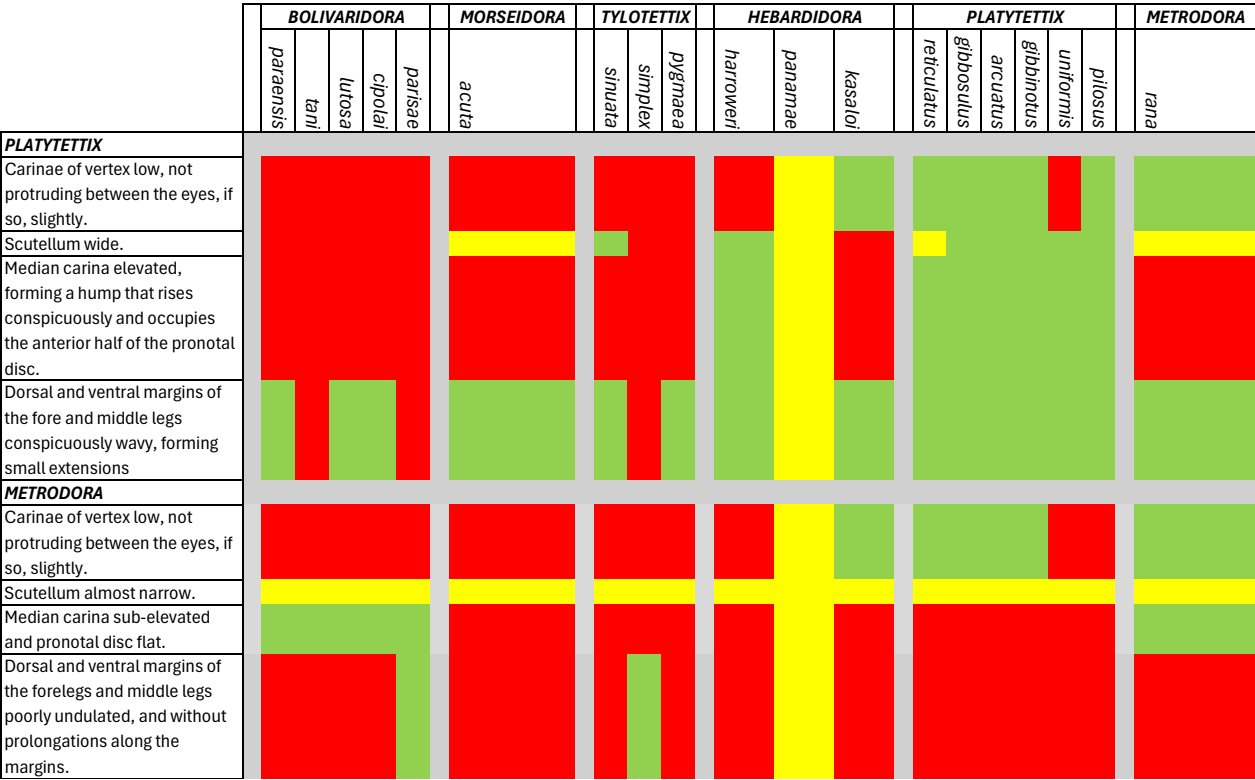


Figure 1. Continued.

Cadena-Castañeda et al. (2025a) also proposed the synonymisation of *Metrodora mollilobata* Kasalo & Skejo, 2025 with *Hebardidora harroweri* (Hebard, 1924). Their justification in the monograph states:

The only notable variation between Metrodora mollilobata syn. nov. and H. harroweri is a slightly more pronounced hump in the former; however, its overall shape remains similar, suggesting intraspecific variation.

This understates how different the crest of *M. mollilobata* is from that of *H. harroweri*. As stated in the diagnosis by Kasalo et al. (2025), the crest of *M. mollilobata* is very similar to the crests of *Platyttix gibbosulus* and *Platyttix arcuatus*—it is quite elevated with a sharply sloping caudal part. In comparison, the crest of *H. harroweri* is visibly lower and has a gentle slope. The shape of the crest is one of the most important characters used in descriptions of Metrodorinae (utilised extensively in the monograph as well) and it cannot be ignored by pronouncing it “intraspecific variation” between morphologically and spatially distant specimens, at least before more specimens have been analysed or before genetic analyses shed more light on the matter. For this reason, we reinstate *Metrodora mollilobata* stat. resurr. as a valid species.

Second, as demonstrated in Fig. 1 and the accompanying text, we found the definitions of genera within Metrodorina as given in the monograph very confusing and diagnosing them through identification keys led to inconsistent results. The monograph resurrected *Platyttix* Hancock, 1906 and *Tylosettix* Morse, 1900 without clear diagnoses. *Hebardidora* was compared to other genera mostly by the shape of

the median carina of the pronotum and infrascapular area, both of which vary significantly within genera as currently defined, so these diagnoses cannot meaningfully separate genera. The monograph differentiated *Bolivaridora* from *Metrodora* and *Platyttix* only by the shape of the fastigium which was stated to be “conspicuously protruding” in *Bolivaridora* and not in the other two genera. However, there is a large variation in this character within *Bolivaridora*, with its type species being very similar to *Metrodora*, both with regard to this character and in general morphology. To avoid guesswork, we consider all of them to be synonymous with *Metrodora* until proper diagnoses are established. We propose the following taxonomic acts:

- *Platyttix* syn. of *Metrodora*;
- *Tylosettix* syn. of *Metrodora*;
- *Hebardidora* syn. nov. of *Metrodora*;
- *Bolivaridora* syn. nov. of *Metrodora*.

The genus *Morseidora* Cadena-Castañeda & Tavares, 2025 is a special case. The comparison section for this genus states only the general shape of the pronotum as a clear differentiating character from other Metrodorina genera, but our examination showed that the way the pronotum is undulated is very similar to *Armasius* Perez-Gelabert & Yong, 2014, i.e. the provided information cannot be used to differentiate the two. Therefore, we propose the following:

Morseidora syn. nov. of *Armasius*, resulting in a new combination *Armasius acutus* comb. nov. of *Metrodora acuta* Günther, 1939. The genus *Armasius* is hereby transferred to the subtribe Metrodorina.

Furthermore, as will be discussed in a later section, *Devrieseium* Cadena-Castañeda & Tavares, 2025 and *Stalitettix* Cadena-Castañeda & Tavares, 2025 lack a clear distinction from *Chiriquia*. Thus, we propose the following:

- *Devrieseium* syn. nov. of *Chiriquia*;
- *Stalitettix* syn. nov. of *Chiriquia*.

The descriptions of the new tribes Otumbini and Garciaitettigini in the monograph were not accompanied by diagnoses at all, with the reader being referred to the key to the tribes. We already discussed the lack of consistency of the keys in this monograph, so here we stress just a few important non-distinctions. The monograph separated Otumbini from Garciaitettigini and Metrodorini only by the shape of the carinae of the vertex and the width of the scutellum, both of which have exceptions that were admitted in the key itself: “Carinae of the vertex produced in different levels” for Garciaitettigini + Metrodorini and “medial carina not strongly expressed” for Garciaitettigini. We believe that the carinae of the vertex could certainly be one diagnostic criterion for tribes, but by no means the only one, because there is no uniform separation of its states between the proposed groups. Following this, the monograph differentiates Garciaitettigini from Metrodorini based on: (i) the medial carina not being strongly expressed in Garciaitettigini (identical to the state of that character in the type species of Metrodorini: *Metrodora*); (ii) Garciaitettigini having a concave vertex and Metrodorini having a convex vertex (not true, discussed later) and (iii) pronotum mostly flat with undulations in Garciaitettigini and arcuate with crests in Metrodorini (we see no meaningful distinction between these descriptions, see the following sections). These proposed groups are highly important for the definition of Metrodorinae; clear evidence is required for their definitions and descriptions. Before they are properly evaluated, we propose to consider them synonyms of Metrodorini, as we failed to find any practical characters for their differentiation in the definitions given in the monograph. We propose the following:

- Garciaitettigini syn. nov. of Metrodorini;
- Otumbini syn. nov. of Metrodorini.

Finally, we did not find any justification for the transfer of *Platythorus* Morse, 1900 to Metrodorinae given in the monograph. As its facial morphology conforms to Tetrigenae and contradicts the diagnosis of Otumbini (see Discussion), we hereby place it in the subfamily Tetrigenae, without tribal placement.

Malagasy Metrodorinae

Tumbrinckitettix syn. nov. of *Cryptotettix* Hancock, 1900

In the monograph, the new genus *Tumbrinckitettix* was erected for *Cryptotettix impennis* Günther, 1939, the only nanoprone species of *Cryptotettix*. *Cryptotettix* is clearly

not monophyletic and has been poorly differentiated from *Oxytettix* since their original description, when only the type species was known, which is why we believe that erecting a new genus in this context will likely create more confusion than clarification. We were unable to confirm the diagnostic characters given in the monograph for defining *Tumbrinckitettix*. The first character given is: the pronotum does not noticeably surpass the apex of the femora in lateral view. This is typical for nanoprone species, where the pronotum is not fully developed (as in nymphs). It is the case with most species of *Oxytettix* (except the macroprone *O. arius* (Rehn, 1930)), which are nanoprone. However, the same is true even in macroprone *Cryptotettix fanovana* Günther, 1974 and *C. similis* Günther, 1974 (see the drawings in Günther (1974)). The second character given is: the space between the eyes is wider than in the other two genera. We found this not to be the case. Günther gave measurements (in his case, the ratio width of one eye/width of the fastigium): 24:33 and 24:37 for *T. impennis*, 22:33 and 25:34 for *C. spinilobus*, 19:24 and from 19:26 to 21:24 for *C. imerina*, 17:18 and 17.5:20 for *O. cataphractus*, 18:24 for *O. macrocerus*, 21:25 for *O. arius*, 20–24.5 for *O. lathraeospanius*, 17:24 and 19:29 for *C. insularis*, 22:27 for *C. fanovana* and 20–26 and 23:27 for *C. similis*. According to these measurements, *T. impennis* has a broad fastigium, but not noticeably different from *C. spinilobus* or *O. lathraeospanius*.

As we are not aware of other differences, *Tumbrinckitettix* is not different from *Cryptotettix* and we consider it a synonym of this genus.

Holocerus and *Notocerus*

In the monograph, *Holocerus devriesei* was transferred to *Notocerus* Hancock, 1900. The monograph argues that the prehumeral tubercle present in *Holocerus* and absent in *Notocerus* is not a generic character, but without providing any justification for this claim. This is indeed the case after having transferred *H. devriesei* to *Notocerus*, but not based on the earlier definitions of these genera. The monograph did not refer in any way to the comparative diagnosis for these genera provided by Skejo et al. (2020), which includes another clearly visible character: in *Notocerus*, the pronotum is elevated between the lateral spines, connecting them (visible in frontal view), while in *Holocerus*, the spines are separate. Therefore, the monograph ignores two established diagnostic characters, providing none to replace them, making another unfounded taxonomic change that makes it impossible to objectively differentiate *Notocerus* from *Holocerus*. The prehumeral tubercle character was then used to separate the species in the key, which is a common practice employed in the monograph (see Discussion).

Hereby, we return *Holocerus devriesei* comb. rev. to its original combination.

Guntheritettiginae

As the monograph states, an informal group of genera from Madagascar was recognised by Günther (1939, 1959, 1974), Devriese (1991) and Skejo et al. (2020).

The literature contains a lot of discussion about the groupings proposed, which one can fall back on to incorporate into one's own perspective. However, we found that several relevant publications and previously proposed groupings are not discussed when introducing the new classification in the monograph. The subfamily Guntheritettiginae is now formally described, although its composition is not completely the same as that given by Günther (1979), which also comprised *Agkistropleuron* Bruner, 1910, *Isandrus* Rehn, 1930 and *Pterotettix* Bolívar, 1887. There is no explanation why these have been excluded. Apart from the monograph having chosen a not well known representative genus as its type, the most concerning fact is that the synapomorphy which all previous authors have mentioned as typical for the group—the absence of an elytral sinus together with the small and narrow elytra in the macropronotal form—is mentioned in the monograph as “weakly developed” in the description and not at all in the comparison with other subfamilies (or unassigned tribes and genera).

The choice of type genera in the new subfamily Guntheritettiginae and its tribes does not follow recommendation 64A of the ICZN, that genera should be chosen that are both well-known and representative of the family-group taxon. Two new genera were described, *Guntheritettix* Cadena-Castañeda & Tavares, 2025 and *Tumbrinckitettix* Cadena-Castañeda & Tavares, 2025 for species known from one or two places in Madagascar and they were designated the type genera for the new tribes. As discussed above, we were unable to identify characters that differentiate the new genus *Tumbrinckitettix* from *Cryptotettix* Hancock, 1900 and *Oxytettix* Rehn, 1930. Therefore, we propose to synonymise it with *Cryptotettix*, in which the type species was originally described.

In summary, we find both the description and the comparison insufficient for taxonomic differentiation. Of course, the fact that Cladonotinae and Metrodorinae are polyphyletic and that some tribes are unassigned complicates comparisons, but this does not mean that comparison should not have been performed in the monograph. The question arises whether it was opportune to create the subfamily.

Guntheritettigini and Tumbrinckitettigini

These tribes have been distinguished as informal groups by Devriese (1991). The main differences between both tribes have already been relatively well described (Devriese 1991), but it is useful to further clarify them here.

In Guntheritettigini, the transverse carina of the pronotum (CT) is absent; significant are the presence of (sometimes spectacular) elevations on the lateral carina of the pronotum (CL) and sometimes on the median carina (CM) in this tribe, the large head with relatively small eyes (ratio total head width/fastigium width > 2) and the quadrangular lobes of the pronotum that are projecting outwards. All known species are macropronotal.

The genera and species of Tumbrinckitettigini are either nanopronotal or macropronotal, have transverse carinae, no elevations on the lateral carinae, a narrower

head (ratio total head width/fastigium > 1.5) and, in most species, spines on the lateral lobes of the pronotum.

Pterotettigini

The position of *Pterotettix* Bolívar, 1887 has always been unclear. Günther (1939) found resemblances with *Morphopus* Bolívar, 1905 and *Discotettix* Costa, 1864 and synonymised *Tetticerus* Hancock, 1900 with it. Later, he (Günther 1974) placed it in the group of *Holoceris-Andriana* (the present Guntheritettigini).

While the resurrection of *Tetticerus* in the monograph has some merits, no analysis is provided for *Ocytettix*, only the photograph of the type of *Ocytettix latihumerus* Hancock, 1907 being provided. From all the pictures and descriptions in the literature, it is clear that at least *Pterotettix* and *Tetticerus* have no elytral sinus and very narrow elytra, which places these genera in Guntheritettiginae according to the current classification.

We, therefore, formally place Pterotettigini in Guntheritettiginae.

It is not clear to us, whether all the species within the newly-created tribe have similar characters. However, until additional material can be studied, we abstain from proposing changes that could only complicate matters for future study.

Günther (1974) changed his opinion on the synonyms of the species of *Pterotettix* that he did not see himself (*Amorphopus simplex*, *Tetrix belphegor* and *Tetrix asmodeus*). However, Cadena-Castañeda et al. (2025b) synonymise *humilis* (and *alluaudi*) with *belphegor* and *simplex* with *andrei*, on the authority of Günther, although this author was never explicit about this. As we have not seen the material ourselves, we cannot confirm or dispute these synonymisations.

Hildegardiinae

The creation of a separate subfamily for *Hildegardia* is, in our opinion, pre-emptive. The only autapomorphy we could identify is the antennae having lateral apical extensions on the antennomeres. We do not find that they “have an incredible appearance that is not seen in any other Tetrigid”, as proposed in the monograph. We do not see any justification in creating a separate subfamily for this genus. Its sister group is still an enigma, but this can be said for a lot of genera, chiefly because nobody has yet made the effort to make a thorough analysis of possible candidates in African and Asian faunas. It is difficult to make a decision about the status of this subfamily, as much research is needed to identify the potential relatives of *Hildegardia*.

Conclusion on the Malagasy Tetrigidae

The study of the Metrodorinae of Madagascar and the Indian Ocean Islands was based solely on a bibliographic study and on a study of a limited number of photographs and lacks a comparative approach. We believe it was premature to present a complete revision on this basis.

However, some taxonomic novelties can be accepted as they formalise opinions by other authors.

In our view, the taxonomy is as follows:

Guntheritettiginae Cadena-Castañeda

Guntheritettigini Cadena-Castañeda

Type genus. *Guntheritettix* Cadena-Castañeda & Tavares.

Tumbrinckitettigini Cadena-Castañeda

Type genus. *Tumbrinckitettix* Cadena-Castañeda & Tavares (= syn. nov. of *Cryptotettix* Hancock).

Pterotettigini Cadena-Castañeda

Type genus. *Pterotettix* Bolívar.

Unassigned genera (in Tetrigidae)

Arexion Rehn, *Hildegardia* Günther, *Isandrus* Rehn, *Storozhenkoium* Cadena-Castañeda

Discussion

Identification keys replacing differential diagnoses

The monograph begins with a re-description of the subfamily Metrodorinae, followed immediately by the re-description of the nominotypical tribe Metrodorini. A large number of morphological features were treated in this description, though mostly in a very general manner, for example, “specimens slender or robust”, “face generally ovoid or subrectangular”, “fore- and mid-femora compressed, with or without conspicuous undulations”. No specific diagnostic characters were described or highlighted. As a result, we found it very difficult to impossible to actually apply this description to any specimen. Which of the many listed characters apply to all members of the group? Which are more reliable than others? What makes Metrodorini Metrodorini?

According to the International Code of Zoological Nomenclature (ICZN 1999) Article 13.1.1., every new name should

be accompanied by a description or definition that states in words characters that are purported to differentiate the taxon.

This is further elaborated in Recommendation 13A:

Intent to differentiate. When describing a new nominal taxon, an author should make clear his or her purpose to differentiate the taxon by including with it a diagnosis, that is to say, a summary of the characters that differentiate the new nominal taxon from related or similar taxa.

Even though names accompanied solely by general descriptions are technically valid under the ICZN (1999), formal differential diagnoses are strongly recommended. A lengthy description does not necessarily serve this purpose more effectively. In fact, a concise, well-founded diagnosis—even a single sentence when properly justified—often proves more useful.

The taxonomic treatments in the monograph do not consistently follow this good practice. References to diagnostic characters are infrequent and unsystematic, providing insufficient differentiation of the proposed taxa. Rather than stating diagnoses directly, the monograph employs identification keys at individual taxonomic levels, which are referenced as if they were diagnoses. In the case of the genus *Otumba*, two species groups are established solely within the key, without any mention in the text.

This approach creates a significant problem—readers must work backwards through the keys to reconstruct the intended diagnoses, which unnecessarily complicates the primary purpose of any taxonomic revision. If taxa can be separated by a key, there logically must be a combination of characters that defines each taxon. These should be explicitly stated.

Wrong differentiating characters

A related issue is that we found numerous cases in which the differentiating characters stated in the keys do not correspond to the morphology visible in the cited taxa.

First, one of the diagnostic characters stated for Metrodorini is: “vertex convex”. A convex vertex is a diagnostic character for Cladonotinae (e.g. Kasalo et al. (2023)), while in Metrodorini, it is flat with its carinae elevated (see the figure in a later section). Another character stated for Metrodorini is “median carinae of pronotum arcuate, mostly forming a crest in different shapes”. This description contains two significant issues: there is only one median carina, not multiple; and within the circumscription of Metrodorini given in the monograph, several genera lack both crests and the described arcuation of the median carina. Furthermore, this character was invoked to separate Metrodorini from *Garciaitettigini* Cadena-Castañeda, 2025, although many *Garciaitettigini* members possess crests formed by median carina elevation.

Second, for the genus *Tylotettix* Morse, 1900, one stated character is: “infrascapular area with medium width, reaching up to the fourth to sixth abdominal segment”. In *T. simplex* Hebard, 1924, the infrascapular area clearly surpasses the body and is notably narrow (Fig. 2A), particularly in comparison to other genera. In the two remaining *Tylotettix* species, the infrascapular areas are partially obscured by hind legs, though at least in *T. sinuata* Morse, 1900, the character appears comparable to that in *T. simplex*.

Third, for the genus *Hebardidora* Cadena-Castañeda & Tavares, 2025, the key states: “crest wavy, formed by the elevated wavy median carina”. Neither the type species (*H. harroweri*) nor *H. panamae* (Hebard, 1924) ex-

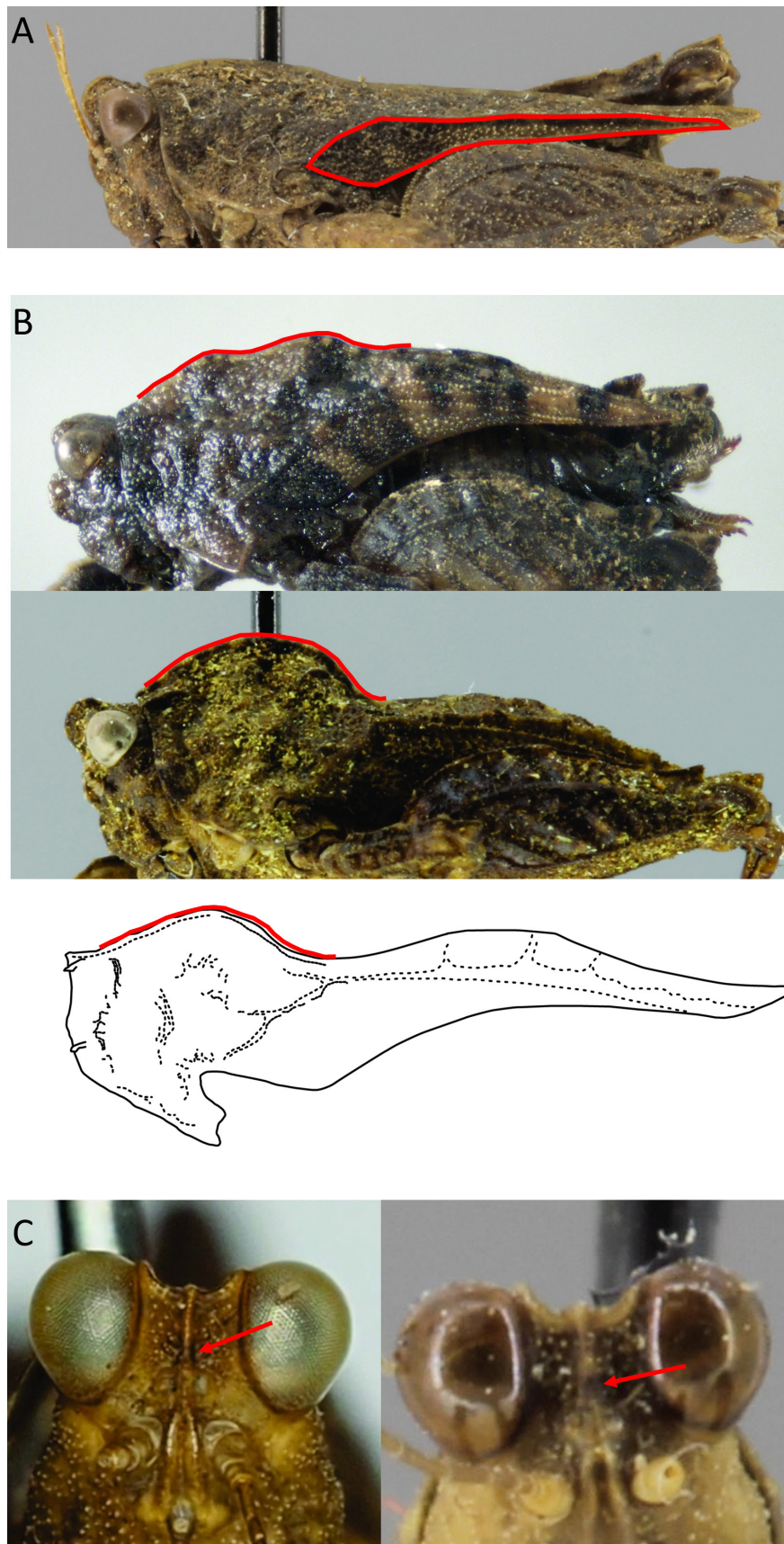


Figure 2. Illustrations of misinterpreted characters in the monograph. **A.** The infrascapular area of *Tylotettix simplex*. Photo adapted from Cadena-Castañeda et al. (2025b); **B.** The crests of *Hebardidora* species. Only the crest of *H. kasaloi* is wavy, while in *H. harroweri* and *H. panamae* (drawing of the holotype), it is rounded. Photos adapted from Cadena-Castañeda et al. (2025b); **C.** The position of the frontal costa bifurcation in *Otumba dentata*. Left photo adapted from Cadena-Castañeda et al. (2025b), right from the Orthoptera Species File, Daniela Silva and Marcelo Pereira.

hibits a wavy crest; only *H. kasaloi* Cadena-Castañeda & Tavares, 2025 does (Fig. 2B).

Fourth, for *Otumba dentata* Hancock, 1907, the key states: “fascial carina diverging on the level of the lower edge of the eyes”. The bifurcation of the frontal costa in this species (and in all other species of *Otumba* Morse, 1900) is at around the middle of eye height (Fig. 2C).

These examples, presented as representative rather than exhaustive, illustrate instances in which the character states listed in the keys differ from those observed by us in the taxa concerned.

Possibly as a consequence of the use of identification keys instead of formal diagnoses and the misinterpretation of differentiating characters, we found several instances in the monograph where mutually exclusive character states of the same character were used to establish taxa at different hierarchical levels. Here, we provide three examples.

First, in the key to tribes, “medial carina strongly expressed” is meant to differentiate Metrodorini from other tribes; however, deeper within the key to Metrodorina, the statement “Carinae of vertex [which includes the medial carina] low, not protruding between the eyes” leads to *Metrodora*, the type genus. This means that the primary diagnostic character for Metrodorini does not apply to its own type genus. This is not merely imprecise phrasing; according to our re-examination, the vertex carinae in *Metrodora* possess nearly identical dimensions and form to those in certain Garciaiittigini, for example, *Stalitettix* and *Garciaiittix* Cadena-Castañeda & Tavares, 2025.

Second, in the key to tribes, Garciaiittigini is characterised by: “median carinae of pronotum slightly elevated in some sections, pronotal disc mostly flat but with mid-sized undulations”. Subsequently, in the key to Garciaiittigini genera, the following is stated: “undulations of the median carina of the pronotal disc low and moderately elevated”. The first diagnosis suggests to us that the median carina is sometimes just barely elevated, while the surface of the pronotum can form wave-like shapes. The diagnosis in the second key then claims that the median carina forms moderate elevations, which is confusing. It is unclear to us what the intended difference between an undulation and a median carina elevation is or if there is any. Furthermore, it is unclear why these undulations in Garciaiittigini are not called “crests” like in Metrodorini even though they are both formed by the elevations of the median carina. This difference in nomenclature implies a greater degree of difference than we could actually confirm—we consider the shape and the position of the median carina elevation in *Metrodora rana* (Metrodorini) and in *Stalitettix spinifrons* (Stål, 1861) (Garciaiittigini) identical. It would have been very useful if the monograph had dedicated some space to the discussion of the ways in which the crests of Metrodorini and Garciaiittigini actually differ and why these differences are phylogenetically important.

Third, in the key to genera of Metrodorina, the state “lateral lobes of the pronotum with the lower margin pointed” leads to *Bolivaridora* Cadena-Castañeda &

Tavares, 2025. Then, the first entry in the key to *Bolivaridora* species states: “lower margin of the lobes rounded”.

Exceptions to general trends amongst members of taxa, especially higher taxa, are not uncommon. This makes writing short and practical keys difficult and is the very reason why (differential) diagnoses and notes are necessary. They not only provide the general pattern of characters and character states, but also explain that, although characters occasionally deviate from the typical state, the character itself is still useful to define the taxon. When it comes to providing differential diagnosis, the monograph occasionally contains “comparison” sections, but exclusively for newly-named genera, not for established genera or genera that were reinstated.

Definitions of taxa with clear outliers

In the previous section, we documented shortcomings in the definitions of taxa across all hierarchical levels. Here, we document how numerous *Metrodora* s.l. species do not conform to the diagnostic characters associated with the genera to which they are assigned. We demonstrate this in Fig. 1 and discuss five more examples to provide evidence for this concern.

The first example involves the new monotypic genus *Grantiatra* Cadena-Castañeda & Tavares, 2025, classified within the subtribe Miriatrina Cadena-Castañeda & Cardona, 2015. However, within the subtribe Metrodorina, the monograph describes *Bolivaridora parisae*, which differs markedly from other *Bolivaridora* species and could readily be considered either a *Grantiatra* species or a closely-related genus. Both taxa possess sharp, similarly-shaped lateral lobes; both have pointed anterior pronotal margins; both possess similarly-formed infrascapular areas; both appear dorsoventrally flattened; and both share comparable vertex morphology (although *B. parisae* exhibits a proportionally wider vertex). Despite sharing all these morphological features, these taxa were placed in distantly positioned taxonomic groups in the monograph. If Metrodorina and Miriatrina are as readily confused as such overlap suggests, what justifies their retention as separate subtribes? This leads us back to the earlier question of higher taxa diagnoses. It is unclear to us which characters are supposed to differentiate Metrodorina and Miriatrina. None of the diagnostic characters for Miriatrina is unique to that group (our comments in square brackets):

Carinae of the vertex conspicuously produced [same in Metrodorina]. *Scutellum almost narrow, delimited by the frontal costa with its nearly straight branches* [narrow scutellum observable in many Metrodorina]. *Median carinae of the pronotum not arcuate, with pronotal disc generally flat, without conspicuous crests* [a very similar description is used for *Bolivaridora* in Metrodorina, while *Grantiatra* in Miriatrina has an elevated median carina]. *Wings well-developed, as long as the pronotum or slightly exceeding it* [*Grantiatra* and *Rehniatra* in Miriatrina are wingless]. *Genicular tooth of hind femora poorly developed* [varies between species in both groups].

Based on the characters provided in the monograph, we were unable to identify a clear basis for assigning genera to one subtribe rather than the other.

The second example is the position of *Bolivaridora tani* Cadena-Castañeda & Tavares, 2025, which the monograph describes under *Metrodorina*, although it does not have its medial carina projecting in front of the vertex. Rather, its entire vertex is projected forwards, much like in *Rehniatra* Cadena-Castañeda & Tavares, 2025, which is placed under *Miriatriina*. Both *B. tani* and *Rehniatra brevifastigiata* (Cadena-Castañeda & Cardona, 2015) also have a shorter third tarsal segment of the hind leg, short antennae and a low median carina. Regardless of whether *R. brevifastigiata* and *B. tani* are actually congeneric or closely related or if perhaps the entire *Bolivaridora* genus is related to *Rehniatra*, these similarities are not discussed in the monograph and we were unable to determine how they were weighted relative to the characters used for classification.

The third example is the placement of *Platythorus* Morse, 1900 in the tribe Otumbini Cadena-Castañeda, 2025. In the Discussion, the monograph states the following:

The tribe Otumbini trib. nov., unlike the previous tribes, camouflaging among bryophytes has not been observed. However, they have cryptic colors in shades of brown, gray, and black. Its appearance is slender, and most of its taxa are winged (except Platythorus), which can be confused with some Tetriginæ. However, upon careful observation, its morphology conforms to what is proposed here for the American metrodorines.

This “careful observation” is not supported—a clear description of these characters is required. *Platythorus* has the bifurcation of its frontal costa placed very high on its face, i.e. the frontal costa is extremely short. The same is true for other Tetriginæ (e.g. Devriese et al. (2023)). Notably, *Cotys* Bolívar, 1887 not only has identical facial morphology to *Platythorus*, but it has a small crest in the same place as it is in *Platythorus*, as well as plenty of other important similarities, like the short third segment of the hind tarsus. The monograph transferred *Cotys* to Tetriginæ, while *Platythorus* was assigned to *Metrodorina* without providing any supportive data. More problematically, *Platythorus* (which has the frontal costa bifurcation at the dorsal margin of the eyes) was assigned to Otumbini in the monograph, which was characterised (incorrectly) as containing species with the frontal costa bifurcation positioned at the ventral margin of the eyes.

The fourth example is the placement of a new Otumbini genus, *Bruneritettix*, described for *Allotettix fuscipennis* Bruner, 1910. The remarks section for the genus contains the following:

It is differentiated by the structure of the maxillary palps, conspicuous eyes (Fig. 119D), and lower margin of the lateral lobes of the pronotum expanded to the sides (Figs. 119A, B). Due to the characteristics described

here, this new genus fits the characteristics of the new tribe Otumbini trib. nov.

Two concerns merit attention. First, none of the characters cited here constitutes part of the proposed Otumbini diagnosis (given within a key), raising questions about their relevance to tribal placement. Second, *Bruneritettix* fits the diagnostic characters of *Garciaitettigini* provided in the key, which reads:

Carinae of the vertex produced in different levels, mostly conspicuous, with lateral carinae forming more or less pronounced horns and medial carina visibly compressed-elevated. Frontal costa rounded or divergent, rarely straight.

As in previously discussed examples, the monograph here asserts that taxa “fit the diagnosis” or “conform” to specific morphologies without providing either the diagnosis itself or the precise characters demonstrating this conformity.

The fifth example is the composition of *Garciaitettigini*. Two new genera were described in the monograph: *Devrieseium* Cadena-Castañeda & Tavares, 2025 and *Stalitettix* Cadena-Castañeda & Tavares, 2025, for two species that were previously assigned to *Chiriquia* Morse, 1900. They were differentiated by slight differences in the medial carina elevation, slight differences in the pronotal humps and the shape of the tegmina. We propose that the differences in these characters are more pronounced amongst *Chiriquia* species than they are between these two genera. The monograph even partially suggests this in the comparison section regarding these genera:

Devrieseium gen. nov. differs from Garciaitettix gen. nov. and from most species of Chiriquia for the pronotum extending well beyond the apex of the abdomen and hind femur.

If *Devrieseium* differs only from most *Chiriquia* species, this raises the question of whether it truly warrants generic status separate from *Chiriquia*. Alternatively, should those *Chiriquia* species with similar characteristics be reclassified as *Devrieseium*? Furthermore, the genus *Otumba* exhibits comparable morphological diversity encompassing the characters used to differentiate *Devrieseium* and *Stalitettix*, yet *Otumba* species are not similarly subdivided. The same applies to median and medial carina variation within certain *Metrodorina* genera. A much greater consistency in the application of generic criteria and the discussion of these decisions is needed.

In all these examples, we found it difficult to follow the reasoning of the authors of the monograph for defining the taxa in question. A priori designation of species and genera to predetermined groups, followed by post-hoc attempts to circumscribe these groups, would be a plausible explanation. If this was the approach to taxon definition taken in the monograph, the conformity to good scientific practice would have to be called into question.

Misinterpretation of the literature

A well-executed taxonomic revision re-examines previously gathered data on the group of interest and provides an updated interpretation. In certain cases, the group has received limited historical examination and a revision provides the first comprehensive interpretation of its taxonomy (e.g. Tumbrinck (2014); Kasalo and Skejo (2024)). In other instances, extensive literature exists on the group, requiring the revision to critically examine available data and synthesise it meaningfully (e.g. Tumbrinck (2018); Skejo et al. (2022)). When prior literature is disregarded, a revision becomes incomplete, necessitating subsequent work that addresses unresolved questions. In this section, we discuss examples from this monograph in which existing literature is disregarded or misinterpreted and insufficient context to substantiate proposals is provided. The monograph extensively refers to a publication by Kasalo et al. (2023) and misinterprets many of its claims, so we provide a comparative overview of these claims here. In the later sections regarding Malagasy Metrodorinae, several more examples of literature misinterpretation are presented.

In a relatively minor publication by Kasalo et al. (2023), the tribe Metrodorini was formally defined and diagnosed for the first time, despite its status as the nominotypical tribe of Metrodorinae. Kasalo et al. (2023) synonymised the tribes Miriatriini Cadena-Castañeda & Cardona, 2015 and Mucrotettigini Cadena-Castañeda & Silva, 2019 with Metrodorini, as their diagnoses could not be meaningfully separated at that time—all three were composed of *Metrodora*-like taxa with the medial carina projected in front of the head. Additionally, Kasalo et al. (2023) transferred *Eleleus* Bolívar, 1887 to Cladonotinae. The objective was to provide a working definition of core Metrodorinae against which other groups could be compared, facilitating eventual clarification of the subfamily's composition.

The monograph's Introduction contains the following:

More recently, the tribe Mucrotettigini was transferred from Cladonotinae into Metrodorini (Kasalo et al., 2023a), although Silva et al. (2019) had previously discussed this possibility.

It is unclear what the Silva et al. (2019) citation refers to. The paper in question (Silva et al. 2019) mentions Metrodorinae exactly once, as a part of the list of subfamilies that occur in the Neotropical Region. *Metrodora* Bolívar, 1887 is mentioned in comparison to *Cota* Bolívar, 1887 (which is very explicitly considered separate from Mucrotettigini) and the taxonomic placement of the Mucrotettigini tribe is not discussed after describing it in Cladonotinae, an entirely different subfamily.

The monograph's Discussion contains the following:

Therefore, the decision of Silva et al. 2019 should not be considered a “failure”, as mentioned by Kasalo et al. (2023a); the tribes that Silva et al. (2019) described only remained within the subfamily Cladonotinae awaiting

future contributions. In the same way that other authors did, it is important to avoid making drastic changes without a complete picture or enough evidence. For instance, Adžić et al. (2020) preferred to keep the tribes Thoradontini and Criotettigini outside of Scelimeninae (Tetrigidae). This position is valid and conservative and seeks to reduce noise in the classification. Still, if the status of Thoradontini and Criotettigini is resolved in the future, it would not be correct to mention that the authors “failed” to exclude those tribes from the subfamily in which they traditionally grouped once they followed the information and evidence available at the time.

This response addresses the following statement from Kasalo et al. (2023):

The original diagnosis by Silva et al. (2019) compares the tribe Mucrotettigini only to the tribe Choriphyllini (Cladonotinae), noting that they are easily separated because the latter tribe exhibits leaf-like morphology. That diagnosis does not take into account the type specimens of either Metrodorinae or Cladonotinae and thus fails to provide evidence for the subfamilial classification of Mucrotettigini.

The comment in Kasalo et al. (2023) simply indicates that, without comparison to type specimens, the original diagnosis lacks the information necessary to determine subfamily placement, i.e. the diagnosis fails to separate subfamilies. The authors' extended response appears to address what they perceive as a personal attack, concluding that errors are not shameful. We concur—errors are inevitable in complex research. Taxonomy requires iterative refinement and new data can substantially alter previous conclusions. Such errors are valuable when the work is conducted diligently, accompanied by transparent reasoning and integrated with established knowledge.

However, the authors themselves state that “it is important to avoid making drastic changes without a complete picture or enough evidence”—a principle that, we suggest, is not consistently applied in their monograph.

Yet another instance of misinterpretation is the following section of the monograph:

Kasalo et al. (2023) proposed keeping Eleleus Bolívar, 1887 within Cladonotinae (without tribal assignment) due to the non-development of the vertex carinae, in contrast to the other genera with which it was previously associated. Nevertheless, the development of the vertex carinae can be variable, very conspicuous like Miriatria, or moderate like Metrodora. However, Hottettix has an organization of the vertex carinae similar to Eleleus, which would conflict with the proposal of Kasalo et al. (2023).

In Kasalo et al. (2023), the following was proposed regarding *Eleleus curtus* Bolívar, 1887:

However, this species has the vertex bulging in the same way as in Cladonotini and Choriphyllini, without well-defined carinae of the vertex.

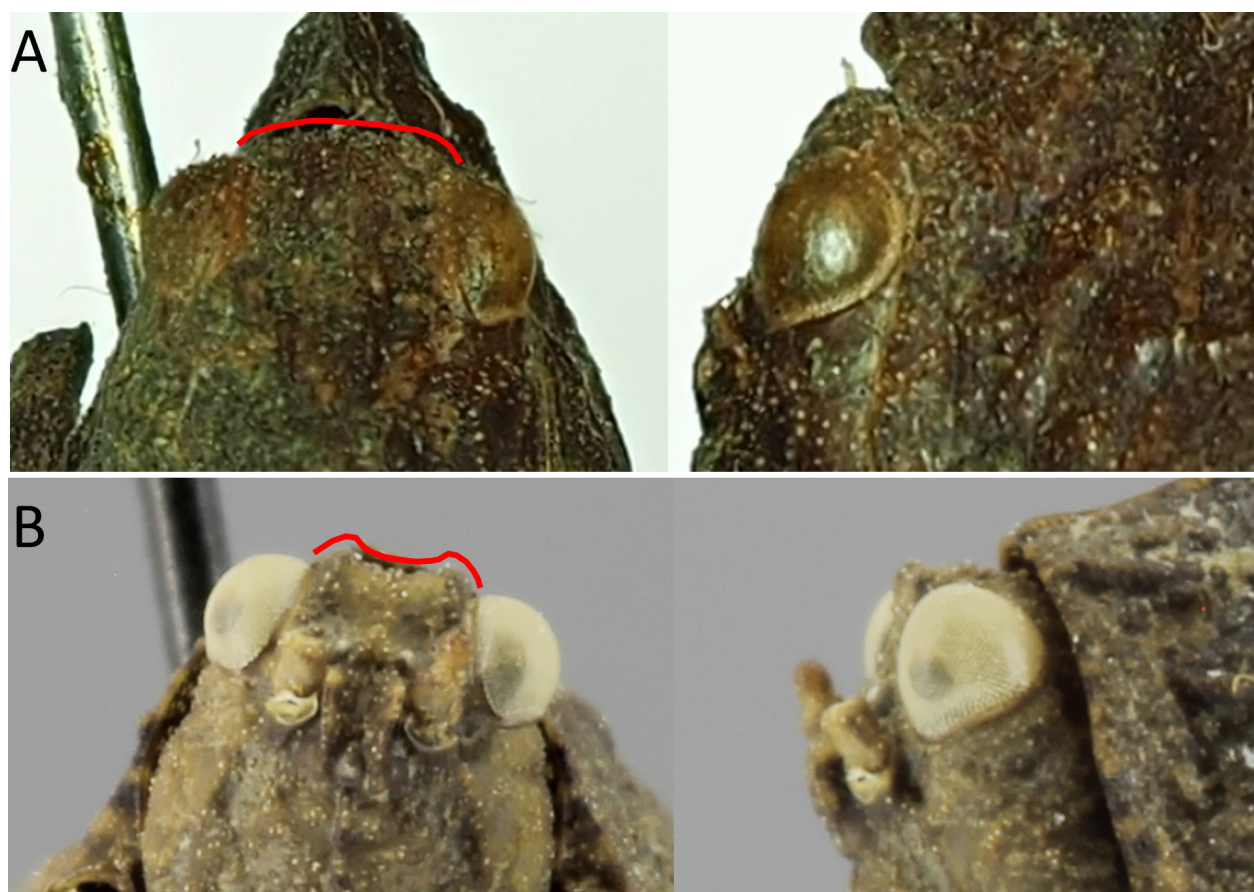


Figure 3. Vertex morphology comparison in *Eleleus curtus* and *Hottettix haitianus*. **A.** The vertex of *E. curtus* is uniformly convex in anterior view. Photos: Josef Tumbrinck; **B.** The vertex in *H. haitianus* is flat with horns formed by elevated lateral carinae. Photos: Daniela Silva and Marcelo Pereira.

Kasalo et al. (2023) focus extensively on the bulging shape of the vertex as a diagnostic character shared by Cladonotinae and this is illustrated in the paper's only figure. The monograph does not address this central point and instead focuses on the degree of carina development. The monograph claims that *Hottettix* Perez-Gelabert et al., 1998 has a similar vertex to *Eleleus* and that this conflicts with the proposal in Kasalo et al. (2023). First, the lateral carinae of the vertex in *Hottettix* are a little elevated and the vertex appears somewhat concave between them, unlike in *Eleleus*, in which the vertex appears uniformly rounded (Fig. 3). Second, if *Hottettix* is indeed similar to *Eleleus*, this does not conflict with the transfer of the latter to Cladonotinae; rather, it would suggest that *Hottettix* should similarly be transferred to Cladonotinae.

Discussion of taxonomic acts in an evolutionary context

Taxonomy and systematics should strive to reflect evolutionary and phylogenetic relationships by assigning names to monophyletic groups. Therefore, if a subfamily is reviewed and new tribes (and even subfamilies) are described, it would be valuable to at least provide a short discussion on how these taxa may be related. The

monograph assigns five tribes, mostly newly described, to “core” Metrodorinae, but there is no attempt to establish any relationships between them. This is a revision of Metrodorinae and, hence, Metrodorinae need to be defined and discussed clearly.

The two new subfamilies described in the monograph receive similarly minimal treatment. More problematically, the abstract states: “Two new subfamilies closely related to Metrodorinae are described”. This proposed close relatedness is not elaborated in the text, despite carrying significant implications for Tetrigidae evolution. How can Hildegardiinae Cadena-Castañeda, 2025 be simultaneously closely related to Metrodorinae and “notably differentiated from the rest of the world tetrigids”? If both new subfamilies are closely related to Metrodorinae, they should share notable similarities worthy of discussion. If they form a monophyletic group, which subfamily do the authors propose as their closest relative? What implications do these new subfamilies carry for the morphological characters currently distinguishing tetrigid subfamilies?

General conclusions

In 2025, Zootaxa published a monograph entitled “Studies on pygmy grasshoppers: On the current Metrodorinae

sensu lato classification (Orthoptera, Tetrigidae) with emphasis on American and Malagasy taxa” by Cadena-Castañeda et al. (2025b). It is one of the most expansive revisionary works in the history of tetrigidology concerning one of the most difficult subfamilies, Metrodorinae. Unfortunately, this work contains many flaws, which are discussed and illustrated in this paper. We identified many basic mistakes, like justifications that lack substance (in the rare cases they are even provided), wrong descriptions of – in our view – clearly visible characters and unclear definitions of important diagnostic characters. Literature was misinterpreted or disregarded. Clear diagnoses were not provided; instead, differential characters were provided through several separate keys. In doing so, diagnoses became inconsistent as the same character was treated differently at different taxonomic levels. Different names were used for the same character, obscuring the lack of objective differences. Most groups are composed of morphologically heterogeneous taxa that do not consistently share the diagnostic characters associated with them. In several cases, taxonomic acts were presented without any evidence that would allow independent evaluation.

As a consequence, our examination suggests that all of the diagnoses and classifications will have to be carefully re-evaluated. Nevertheless, the names assigned to taxa in the monograph are valid and have priority under the ICZN (1999) because biological taxonomic nomenclature—and, by extension taxonomy—does not explicitly necessitate good scientific practice (Ciplak et al. 2026).

Similar problems to the ones identified here are also evident in previous publications dealing with other groups of Tetrigidae, such as *Amorphopini* Günther, 1939 (Cadena-Castañeda et al. 2020) and *Scaria* Bolívar, 1887 (Cadena-Castañeda et al. 2019). This problem goes beyond Tetrigidae, extending to a variety of other orthopteran groups (Cadena-Castañeda 2019; Cadena-Castañeda et al. 2022; Cadena-Castañeda et al. 2024; Cadena-Castañeda 2026). It is, therefore, imperative that the taxonomy of Orthoptera is held to objective scientific standards, which is a point that has been repeatedly raised in the Orthopterists community recently (Ciplak et al. 2026; Fianco and Melo 2026).

This monograph faced us with a dilemma—namely, how to treat the names proposed by Cadena-Castañeda et al. (2025b). On the one hand, the ICZN provisions suggest that many of these names are technically valid, given that most are associated with designated types and some form of description, however minimal or inconsistent. On the other hand, we demonstrated that the monograph itself is methodologically unsound, containing many internal inconsistencies, misinterpretations of the literature and a lack of diagnostic clarity. Given this, our proposed synonymisations offer a middle ground: they allow us to formally acknowledge the names as regulated by the Code, while also signalling their current lack of usability and their scientific unreliability. By doing so, we neither legitimise nor ignore the flaws of the monograph, but take a cautious and pragmatic approach that serves both taxonomic stability and scientific integrity. For the fauna

of Madagascar, we have provided a brief revision of the main higher groups that may aid further research efforts. Unfortunately, for the Neotropical fauna, this cannot be done easily, as we now have a nearly inextricable state of affairs that may take years to resolve.

The examples provided here are not as egregious as the most well-known cases of questionable taxonomic work popularly described as “taxonomic vandalism” (Páll-Gergely et al. 2020; Wüster et al. 2021). However, they have in common the practice of publishing a large number of poorly-justified taxonomic names, without adequate research and with questionable peer review. Besides this monograph, several highly taxonomically disruptive works were recently published in *Zootaxa* (discussed by Ciplak et al. (2026) and Fianco and Melo (2026)). We do not wish to place the blame solely on the journal or its reviewers, but the fact that multiple large-scale works of low scientific quality were published in such a short amount of time is alarming and indicates that some effort should be made to ensure that works of this nature are identified prior to publication.

We understand that papers such as this one may put a strain on the small Orthopterists community, but we also believe that it is necessary to call out substandard practices. This is not a personal attack on the authors, but a critical examination of their published work. With this in mind, we invite the authors to re-examine their workflow. We also invite the Orthopterist community to hold each other to higher standards; we all share a common goal.

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Additional information

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The authors have declared that no competing interests exist.

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Data availability

All of the data that support the findings of this study are available in the main text.