



In favor of the principle of nomenclatural stability: the case of the Gomphocerini (Orthoptera: Acrididae)

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Nolen *et al.* (2020) studied sympatric grasshopper species of the genus *Chorthippus*, which have evolved strong behavioural isolation while lacking noticeable ecomorphological divergence. The authors found that mitochondrial genomes suggest that the radiation is relatively recent, dating to the mid-Pleistocene, which leads to extensive incomplete lineage sorting throughout the mitochondrial and nuclear genomes. Initial periods of geographic isolation might have facilitated the association between male signaling and female preference, permitting the coexistence of sympatric species that are genetically, morphologically, and ecologically similar, but otherwise behave mostly as good biological species.

Interestingly, *Gomphocerippus rufus*, a species characterized by a distinctive mating display with a highly characteristic courtship song and clubbed antenna, is nested inside the European *Chorthippus* clade, suggesting that this lineage belongs to the same radiation and should instead be classified as *Chorthippus* (Nolen *et al.* 2020).

Defaut (2022), basing on the data shown by Nolen *et al.* (2020) established that the proximity of *Gomphocerippus rufus* with four species of "*Chorthippus*" gr. *biguttulus* does not imply transferring the *rufus* species into the genus *Chorthippus* Fieber 1852, but on the contrary transferring the species of the *biguttulus* group (that is belonging to the subgenus *Glyptobothrus* Chopard, 1951) to the genus *Gomphocerippus* Roberts, 1941 for the principle of priority.

Discussion

We argue both conclusions should be considered preliminary, based upon the following reasoning.

The tribe Gomphocerini Fieber, 1853 includes the following genera distributed in Eurasia, North Africa and America (Cigliano *et al.* 2023): *Aeropedellus* Hebard, 1935, *Bruneria* McNeill, 1897, *Chorthippus* Fieber, 1852 (containing other two subgenera other than *Chorthippus*, namely: *Altichorthippus* Jago, 1971, *Glyptobothrus* Chopard, 1951), *Dasyhippus* Uvarov, 1930, *Gomphoceridius* Bolívar, 1914, *Gomphocerippus* Roberts, 1941, *Gomphoceroides* Zheng, Xi & Lian, 1992, *Gomphocerus* Thunberg, 1815, *Mesasippus* Tarbinsky, 1931, *Myrmeleotettix* Bolívar, 1914, *Pezohippus* Bey-Bienko, 1948, *Phlibostroma*, Scudder, 1875, *Pseudochorthippus* Defaut, 2012, *Schmidtiacris* Storozhenko, 2002, *Stauroderus* Bolívar, 11897, and *Stenobothrodes* Xu & Zheng, 1996.

Nolen *et al.* (2020) only analyzed *Chorthippus* subg. *Glyptobothrus* (partly revised by Willemse *et al.* 2009, who, nevertheless, considered *Glyptobothrus* a species group more than a subgenus), *Gomphocerippus*, *Gomphocerus*, and *Pseudochorthippus*; they also compared them with *Euchorthippus* Tarbinsky, 1926, which belongs to the tribe Chrysochraontini Brunner von Wattenwyl, 1893, and *Megaulacobothrus chinensis* (Tarbinsky, 1927), belonging to the tribe Stenobothrini Harz, 1975.

Overall, out of 18 generic or subgeneric taxa within Gomphocerini, Nolen *et al.* (2020) only analyzed 13. We think that their results should be considered provisional until the comparison with all other genera and subgenera belonging to the tribe Gomphocerini has been completed. According to Hawlitschek *et al.* (2020) their topology testing shows that the phylogenetic discordance observed between the mitochondrial and the nuclear estimates are statistically significant; this implies that future taxonomic revisions of this group should not be based on mitochondrial data alone, even if the entire

mitochondrial genome is considered. In addition, they consider that the placement of *Gomphocerus*, *Stauroderus*, and *Gomphocerippus* within *Chorthippus* in their tree supports the view that *Chorthippus* needs revision, and advocate for postponing any taxonomic changes until more data becomes available.

Conclusions

Thus, in order not to introduce unnecessary confusion into the current taxonomic arrangement, we strongly advise to refrain from introducing systematic changes until there is a clear understanding of the relationship, both from the genetic, morphological, and bioacoustics point of view for all taxa in this tribe.

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