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Case 3768 – *Hybosorus illigeri* Reiche, 1853 (Insecta, Coleoptera): proposed conservation by giving it precedence over *Hybosorus pinguis* Westwood, 1845, *Hybosorus roei* Westwood, 1845 and *Hybosorus carolinus* LeConte, 1847

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Abstract. The purpose of this application, under Article 23.9.3 of the Code, is to conserve the widely used specific name *Hybosorus illigeri* Reiche, 1853 (Coleoptera: Scarabaeoidea, HYBOSORIDAE), a globally widespread and common scarab beetle. The name is threatened by the very rarely used senior subjective synonyms *Hybosorus pinguis* Westwood, 1845, *Hybosorus roei* Westwood, 1845, and *Hybosorus carolinus* LeConte, 1847. Precedence of the name *Hybosorus illigeri* is proposed to maintain stability of nomenclature.

Keywords. Nomenclature; taxonomy; Coleoptera; HYBOSORIDAE; *Hybosorus illigeri*; *Hybosorus pinguis*, *Hybosorus roei*, *Hybosorus carolinus*.

1. *Hybosorus illigeri* Reiche (1853: 87) (Coleoptera, Scarabaeoidea, HYBOSORIDAE, HYBOSORINAE) is a widespread common beetle, occurring through most of Africa (including Madagascar and the Mascarene islands), the Mediterranean and most of temperate and tropical Asia as far as China. This species is prone to passive transportation and has been introduced into the U.S.A., Central America (Cuba, Haiti, Bahamas, Jamaica, Nicaragua and Mexico) and Venezuela (Ocampo, 2002; Ocampo & Ballerio, 2006; Peck, 2005). It is one of the very few SCARABAEOIDEA known to be a predator (Rozas et al., 1991) and in some areas has been reported as a nuisance pest of golf courses (Buss, 2006).

2. The widely used name *Hybosorus illigeri* Reiche, 1853 is a replacement name for *Scarabaeus arator* Illiger (1803: 210) due to homonymy with *Scarabaeus arator* Fabricius (1775: 18) (now *Heteronychus arator*; SCARABAEIDAE, DYNASTINAE). The original type of *Scarabaeus arator* Illiger, 1803 is lost and a neotype was designated by Landin (1964). It is deposited in the collection of the Entomological Institute of the University of

Lund, Sweden.

3. Being a widespread species, it is not surprising that *Hybosorus illigeri* has several synonyms. Among them there are three senior names, namely *Hybosorus pinguis* Westwood (1845: 440) (first synonymized by Endrődi, 1957), *Hybosorus roei* Westwood (1845: 440) (first synonymized by Arrow, 1912), and *Hybosorus carolinus* LeConte (1847: 84) (first synonymized by LeConte, 1862) that have been treated as junior synonyms of *H. illigeri* (i.e., listed as synonyms of a valid *H. illigeri*). This happened perhaps because some authors (e.g., Arrow, 1912; Schmidt, 1913), while dealing with this species, simply copied the list of junior synonyms elaborated when the valid name was still *H. arator* (Illiger, 1803), without taking into consideration that the name had changed for a much younger one. According to Article 23.3 of the Code *Hybosorus pinguis*, *Hybosorus roei*, and *Hybosorus carolinus* strictly should take precedence over *Hybosorus illigeri*.

4. Kuijten (1983) published a revision of the genus *Hybosorus*, which after 35 years still represents the state of the art for the taxonomy of this genus and is unanimously followed by all authors involved in hybosorine taxonomy (including the authors of this application, who comprise almost all the students currently publishing on hybosorine taxonomy). In that revision Kuijten studied the type material and designated lectotypes for, amongst others, *H. pinguis*, *H. roei*, and *H. carolinus*, solved the taxonomy of *Hybosorus illigeri* and allied species, but did not resolve the aforementioned nomenclatural problem and listed the three senior synonyms as if they were junior synonyms of *Hybosorus illigeri*. With Kuijten's work, we now have a clean and accepted taxonomy but still a problematic nomenclature for this species.

5. In December 2006, Allsopp & Branco tried to solve the nomenclatural problem by sending an application to the Commission, which was later published as Case 3400 (Allsopp & Branco, 2007). The authors asked the Commission for a reversal of precedence of the names *Hybosorus roei* Westwood, 1845 and *Hybosorus illigeri* Reiche, 1853 to save the name *H. illigeri* since Art. 23.9.2 was not applicable due to two usages of the name *H. roei* post 1899 (see below). They also claimed that the other two names (*H. pinguis* Westwood, 1845 and *H. carolinus* LeConte, 1847) were nomina oblita. The application was eventually rejected in Opinion 2230 (ICZN, 2009), without placing any names on Official Lists or Indexes and leaving the issue open for making new proposals to the Commission.

6. According to the Commissioners who commented on the Case, the reasons for the rejection were the perceived lack of a sound taxonomic base for the involved taxa and the lack of evidence that the names *H. pinguis* and *H. carolinus* were nomina oblita. The lack of a sound taxonomic framework, as we outlined above, was a misperception as Kuijten's revision fulfills this purpose. Conversely, the Commissioners who had doubts about the nomina oblita were correct. A careful review of the literature revealed that both *H. pinguis* and *H. carolinus* had rare post-1899 usages as valid names.

7. *Hybosorus carolinus* has been used once by Endrődi (1957) as a subspecies of *H. illigeri*, quoting *Hybosorus arator* (sic!) ssp. *carolinus* as a doubtful geographical subspecies. *Hybosorus pinguis* had been used as a valid name by Arrow (1912: 36) and then by Schmidt (1913: 45). Finally, as already stated by Allsopp & Branco (2007), *H. roei* has been used twice by Ádám (1994: 9, 2003: 132), an author known for finding older unused synonyms and disregarding prevailing usage. We can add three more usages of *roei*, i.e., by Endrődi (1957) as a doubtful geographical subspecies of *H. arator*, by Chikatunov & Pavlíček (1997), and by Chikatunov et al. (1999: 80). It must also be added that, due to the rejection of the precedence of *H. illigeri* in Opinion 2230, there have been

at least two more usages of the name *roei* in literature after 2009 (Mienis, 2016; Huchet, 2017), both referring to the Opinion. Huchet (2017) wrote: “Le nom de *Hybosorus illigeri* (Reiche, 1853), largement utilisé depuis dans la littérature, a été récemment rejeté par la Commission Internationale de Nomenclature zoologique (ICZN, 2009) au profit de *Hybosorus roei* Westwood, 1845.”, while Mienis (2016) cited the Opinion as reference for the validity of *H. roei*.

8. Compared to the three rarely used senior names, *H. illigeri* scores immensely more widespread and frequent usage. Allsopp & Branco (2007) listed 42 post-1899 usages, up to 2006. We can add further 82 usages between 1899 and 2009 (Ahrens & Vogler, 2008; Al-Houty, 1989; Anonymous, 1907; Baguena Corella, 1967; Baraud, 1992; Bedel, 1911; Blanco Villero et al., 2007; Branco, 2007; Carpaneto & Piattella, 1995; Chandra, 2000; Chimişliu, 2000a; Chimişliu, 2000b; Chimişliu, 2000c; Chimişliu, 2002; Chimişliu, 2004a; Chimişliu, 2004b; D’Hotman & Scholtz, 1990; Dellacasa, 2003; Dzhambazishvili, 1979; Dzhambazishvili, 1990; Evans, 2009; Fedorenko, 2009; Georghiou, 1977; Gobbi & Piattella, 2008; Gridelli, 1930; Guenat, 1989; Gül-Zümreoglu, 1972; Harpootlian, 2001; Hellyer & Aspinall, 2005; Henschel et al., 2003; Isaksson, 2009; Kazmi & Ramamurthy, 2004; Keith & Drumont, 2004; Keskin et al., 2008; Kirk, 1969; Kirk, 1970; Kocher, 1958; Lapiana & Sparacio, 2006; Learaut, 2008; Lodos, 1989; López-Colón, 1999; López-Colón, 2003; López-Colón & Blasco Zumeta, 1997; López-Colón et al., 1997; Martín-Piera & López-Colón, 2000; Masters, 1980; Mateu Sanpere, 1950; Medler, 1980; Medvedev & Lopatin, 1961; Mikšić, 1955; Mikšić, 1956; Mikšić, 1957; Mittal, 2005; Monnot et al., 1914; Morales et al., 2004; Morón, 2004; Nikolaev, 1987; Nikolaev & Sojunov, 1991; Normand, 1936; Novak, 1952; Novak, 1970; Olsoufieff, 1918; Paulian, 1937; Paulian, 1941; Paulian, 1959; Paulian, 1981; Peck, 2005; Peck & Thomas, 1998; Pesarini, 2004; Pretorius & Scholtz, 2001; Ptashkovsky, 2009; Reaudin, 2009; Rozner & Rozner, 2009; Seely, 1990; Shokhin, 2002; Shokhin, 2007; Sparacio, 1995; Storey, 1916; Veiga & Martín Piera, 1988; Weeks et al., 2003; Yablokov-Khinzoryan, 1967; Zavattari, 1934).

9. Notably, the name *H. illigeri* has remained in prevailing usage after the 2009 Opinion of the Commission, exemplified by a list of 48 references by 123 authors using that name as valid, published between 2010 and 2017 (Abdel-Dayem et al., 2017; Aguilar-Castillo et al., 2013; Ahrens et al., 2011; Arnone, 2010; Bai et al., 2015; Ballerio & Bezdek, 2016; Ballerio & Grebennikov, 2016; Ballerio et al., 2010; Bezborodov et al., 2014; Brelh et al., 2010; Bunalski et al., 2014; Carpaneto et al., 2011; Carrillo-Ruiz et al., 2017; Chapelin-Viscardi & Lacroix, 2010; Chimişliu, 2017; Chong & Hinson, 2015; Cuate-Mozo et al., 2016; Deloya & Ponce Saavedra, 2016; Evans, 2014; Frolov et al., 2017; González-Hernández et al., 2011; Guo et al., 2017; Herrmann et al., 2010; Jagdale & Magdum, 2017; Jain & Mittal, 2012; Keith & Bordat, 2011; Krajcik, 2012; Král & Batelka, 2017; Lawrence et al., 2011; Lugo-García et al., 2011; Lugo-García et al., 2013; Lugo-García et al., 2014; Martynov, 2012; Montreuil, 2014; Morón & Márquez, 2012; Ocampo et al., 2010; Özgen et al., 2014; Parnaudeau, 2010; Perez-Gelabert, 2013; Pivotti et al., 2011; Russell, 2012; Scholtz & Grebennikov, 2016; Shokhin, 2011; Shokhin et al., 2012; Shokhin et al., 2014; Trujillo-Miranda et al., 2016; Valladares et al., 2013; Zamora-Vuelvas et al., 2014). We now can give evidence for a total of at least 172 usages of the name *H. illigeri* post 1899 by at least 230 authors versus one usage by one author of the name *H. carolinus*, two usages by two authors of the name *H. pinguis* and seven usages by seven authors of the name *H. roei*.

10. It must also be stressed that the names *H. pinguis* and *H. roei* were introduced in the

same year in the same paper and no first reviser has yet stated which of them should have priority. This means that in case this application is rejected, then the correct name to apply to the taxon currently known as *H. illigeri* would remain unresolved between *pinguis* and *roei*.

11. Since we have a name used over 170 times by at least 230 authors and three competing senior synonyms used very few times, we suggest that, in order to fix the nomenclature once for all, precedence should be given to the most widespread name, i.e., *H. illigeri* under Art. 23.9.3, in order to maintain universality and to avoid confusion.

12. The International Commission on Zoological Nomenclature is accordingly asked:

- (1) to use its plenary power to give the specific name *illigeri* Reiche, 1853, as published in the binomen *Hybosorus illigeri*, precedence over the names:
 - (a) *roei* Westwood, 1845, as published in the binomen *Hybosorus roei*, whenever the two are considered to be synonyms;
 - (b) *pinguis* Westwood, 1845, as published in the binomen *Hybosorus pinguis*, whenever the two are considered to be synonyms;
 - (c) *carolinus* Le Conte, 1847, as published in the binomen *Hybosorus carolinus*, whenever the two are considered to be synonyms;
- (2) to place on the Official List of Specific Names in Zoology the following names:
 - (a) *illigeri* Reiche, 1853, as published in the binomen *Hybosorus illigeri*, with the endorsement that it is to be given precedence over the following names:
 - (i) *roei* Westwood, 1845, as published in the binomen *Hybosorus roei*, whenever the two are considered to be synonyms;
 - (ii) *pinguis* Westwood, 1845, as published in the binomen *Hybosorus pinguis*, whenever the two are considered to be synonyms;
 - (iii) *carolinus* Le Conte, 1847, as published in the binomen *Hybosorus carolinus*, whenever the two are considered to be synonyms;
 - (b) *roei* Westwood, 1845, as published in the binomen *Hybosorus roei*, with the endorsement that it is not to be given priority over the name *illigeri* Reiche, 1853, as published in the binomen *Hybosorus illigeri*, whenever the two are considered to be synonyms;
 - (c) *pinguis* Westwood, 1845, as published in the binomen *Hybosorus pinguis*, with the endorsement that it is not to be given priority over the name *illigeri* Reiche, 1853, as published in the binomen *Hybosorus illigeri*, whenever the two are considered to be synonyms; and
 - (d) *carolinus* Le Conte, 1847, as published in the binomen *Hybosorus carolinus*, with the endorsement that it is not to be given priority over the name *illigeri* Reiche, 1853, as published in the binomen *Hybosorus illigeri*, whenever the two are considered to be synonyms.

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