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**New tribal and generic placement for taxa of Pterostichini (auct.)  
(Coleoptera: Carabidae) from the Juan Fernández Archipelago,  
Chile with taxonomic notes on *Trirammatius* Chaudoir, 1838**

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*Abstract.* Based on the study of types and recently collected specimens, taxa from the Juan Fernández Archipelago, Chile, presently considered *incertae cedis* within *Pterostichus* Bonelli, 1810 are newly placed based on adult morphological characters. *Pterostichus kuscheli* Straneo, 1955:131 is placed within *Metius* Curtis, 1839 in the tribe Metiini. *Metius kuscheli* (Straneo 1955:131), **comb. nov.** is regarded as a secondary subjective homonym of *Metius kuscheli* Straneo, 1955:137. *Metius guillermoi* **nom. nov.** is proposed as a replacement name for *Metius kuscheli* (Straneo 1955:131). Taxa in Pterostichini—*Pterostichus selkirki* Andrewes, 1931, *P. skottsbergi* Andrewes, 1931 and *Pterostichus ignobilis* (Chaudoir 1876)—are all newly combined in *Trirammatius* Chaudoir, 1835, all **comb. nov.** The taxonomic history of *Feronia ignobilis* Chaudoir, 1876 is clarified as it involves placement in several genera and a mix of species were included in the type series. Characters important for tribal and generic placement are discussed and illustrated for these taxa. *Trirammatius guerini* (Waterhouse 1841) is found to be a synonym of *Loxandrus dubius* (Curtis 1839) (Loxandriini), **syn. nov.**

*Key Words.* Coleoptera, Carabidae, Metiini, Loxandriini, Pacific island fauna, Robinson Crusoe Island.

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INTRODUCTION

When Andrewes (1931) reviewed the carabid species of the Juan Fernández Islands he described three species placing them in the genus *Pterostichus* Bonelli, 1810. He noted that they “present unusual characters, and none would be included under *Pterostichus* sens. str.,” but he concluded that too little was known of the South American fauna at the time to make placement in an existing genus or description of a new genus appropriate. Instead he deferred to “a more intensive study of the fauna in future years.”

There are presently only six endemic species of Pterostichini (auct.) described from the Juan Fernández Archipelago. Of these three still remain *incertae cedis* in *Pterostichus* whereas all others, and all other South American Pterostichini, are ascribed to various genera (Straneo 1977, 1979; Lorenz 1998). As presently conceived, *Pterostichus* is a diverse Holarctic genus that does not have any clear close relatives in the Southern Hemisphere (Moore 1965, Will 2000). My recent collection of specimens from one of the islands of the archipelago, Robinson Crusoe Is., and study of types and additional material make it possible to place these species in South American taxa.

MATERIALS AND METHODS

Specimens used for this study were borrowed from the following institutions: The Natural History Museum, London (BMNH); Museo de Civico, Milano, Italy (MCHN); Muséum National d'Histoire Naturelle, Paris (MNHN), Essig Museum of Entomology,

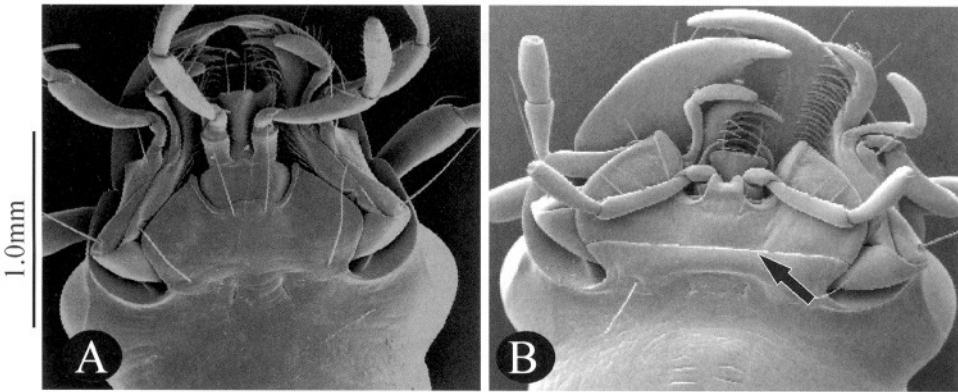


Figure 1. Ventral view of mouth parts showing A. fused mentum and submentum of *Metius guillermoi*. B. suture between mentum and submentum in *Trirammatus selkirki*.

Berkeley, Ca., USA (EMEC) and Museo Nacional de Historia Natural, Santiago, Chile (MNNC). The last two collections include material collected during my field work in 2002. Selected males and females of all species were dissected to examine genitalia and defensive gland structures following methods outlined by Will (2002).

#### TAXONOMIC TREATMENT

*Metiini*. Study of specimens of *Pterostichus kuscheli* Straneo, 1955 (in Straneo & Jeannel 1955:131), Straneo's description based on a single teneral female (Straneo & Jeannel 1955) plus subsequent description of the male (Straneo 1957) provide evidence that this species is actually a member of the genus *Metius* Curtis, 1839.

Taxa included in *Metiini* (often treated as a subtribe of Pterostichini) have the mentum and submentum fused (Fig. 1A) versus the condition wherein these sclerites are separated by a distinct suture (Fig. 1B); metiines also exhibit an asymmetrical apical expansion of efferent duct of the pygidial gland reservoir (Fig. 2, al). All metiine taxa except *Feroniola* Tschitschérine, 1900 have dorsally setose paraglossae (Fig. 3A) as opposed to the typical glabrous condition (Fig. 3B). *Pterostichus kuscheli* exhibits all of these characteristics and shares monomeric, presumably fused, spoon-shaped gonocoxites of the female genitalia and a very slightly produced mentum tooth (Fig. 3A) with at least some *Metius* species, e.g., *M. flavipes* (Dejean 1828). *Pterostichus kuscheli* is larger and more elongate than typical *Metius* species, and somewhat similar to *Abropus carnifex* (Fabricius 1775). However, it differs from that metiine species by its scarcely emarginate penultimate tarsomere (Fig. 4A), which is notably bilobed in *A. carnifex* (Fig. 4B). Both of these are more markedly emarginate than is typically found in pterostichines (Fig. 4C). Based on this evidence, *Pterostichus kuscheli* is removed to *Metiini* as *Metius kuscheli* (Straneo 1955), **comb. nov.**

Recognition of Straneo's species as a member of *Metius* makes it a secondary subjective homonym (ICZN 1999, Article 52) of *Metius kuscheli* Straneo, 1955:137. In this case the taxa are considered to have been published simultaneously (ICZN 1999, Article 24) and fall under the Principle of the First Reviser (ICZN 1999, Article 24.2). The taxon being moved into *Metius*, *Pterostichus kuscheli*, is considered the junior subjective homonym and *Metius guillermoi* **nom. nov.** is proposed as a replacement name for *Metius kuscheli* (Straneo 1955:131).

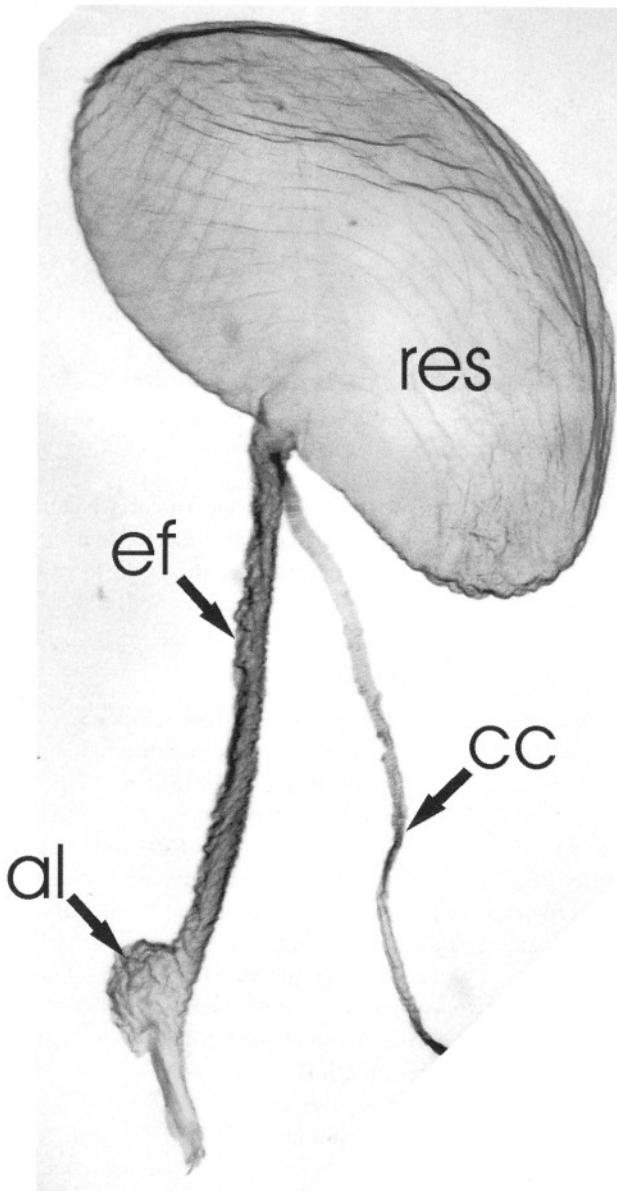


Figure 2. KOH cleared and stained single pygidial gland reservoir of *Metius guillermoi*, res = reservoir, cc = collecting canal, ef = efferent duct, al = apical lobe of efferent duct.

*Pterostichini*. The three remaining *Pterostichus* species described from the Juan Fernández Archipelago are very likely closely related to each other. All three can be placed in the subtribe Euchroina (Will 2000, 2002) as they share features of the female reproductive tract such as the gooseneck-form bursa and tripartite system (spermatheca, appended gland and diveticula (Liebherr & Will 1998, Will 2002). Many, but not all, beetles included in the euchroine taxa have metacoxal sulci that are sinuate or arcuate and

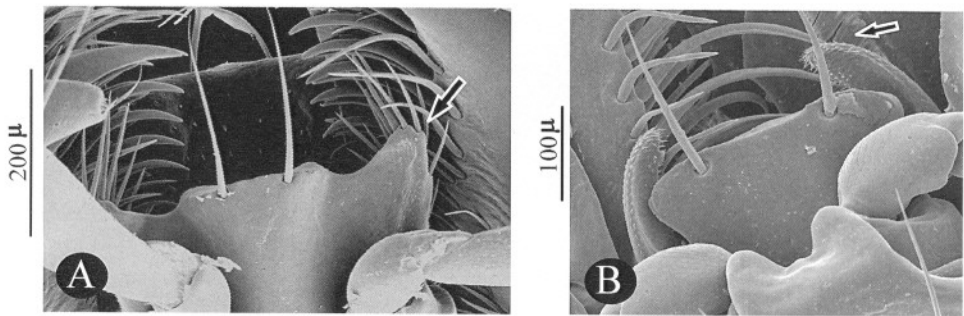


Figure 3. Apex of glossal sclerite showing A. arrow indicating the coarsely setose dorsal surface of the paraglossa of *Metius guillermoi*. B. arrow indicating glabrous dorsal surface of the paraglossa of *Trirammatus selkirki*.

distant from the coxal anterior margin. This condition is not found in *Pterostichus* species. All three species from the Juan Fernández Archipelago have short, arcuate metacoxal sulci.

In van Emden's (1958) description of *Plagioplatys pseudoharpalus* he stated that *Pterostichus selkirki* Andrewes, 1931 belonged in this genus (then treated as a subgenus of *Pterostichus*) together with *P. pseudoharpalus* and the type species, *P. vagans* (Dejean 1831). All the Juan Fernández taxa and both species of *Plagioplatys* Tschitschérine, 1900 have the apex of the prosternal process margined and the angular base of stria one impressed. These attributes, in combination with an elongate metepisternum, are key characteristics (Straneo 1979) for *Plagioplatys*. However, one or more of these characteristics are lacking in any given *Trirammatus* Chaudoir, 1835 species. The prosternal process is margined in the type species *T. unistriatus* (Dejean 1828) but not margined in *T. torqueotrochantus* Will, 2004. The angular base of stria one is variably impressed among the species of the genus and even varies among individuals in some species. The only likely synapomorphic character noted by van Emden is the expansion near the apex of the meso- and meta-tibiae in males. Unfortunately the type specimen of *P. vagans* is damaged and lacks its meso- and meta-legs. As compared to females, male *Trirammatus* species do have variously modified legs, the tibiae are generally dilated apically and the form is somewhat arcuate or subtly sinuate. This is most prominent in *Trirammatus* species from the Juan Fernández. Within the euchroine genera, *Trirammatus* includes species with two setae at the base of the claw (Fig. 5) rather than the more common single seta condition as observed among *Plagioplatys* species. The presence of two setae at

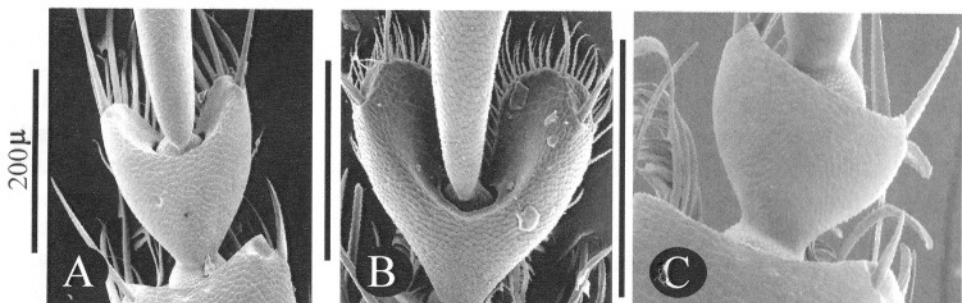


Figure 4. Penultimate tarsomeres showing A. scarcely emarginated form in *Metius guillermoi*. B. bilobed form in *Abropus carnifex*. C. nearly truncate form in *Trirammatus skottsbergi*.

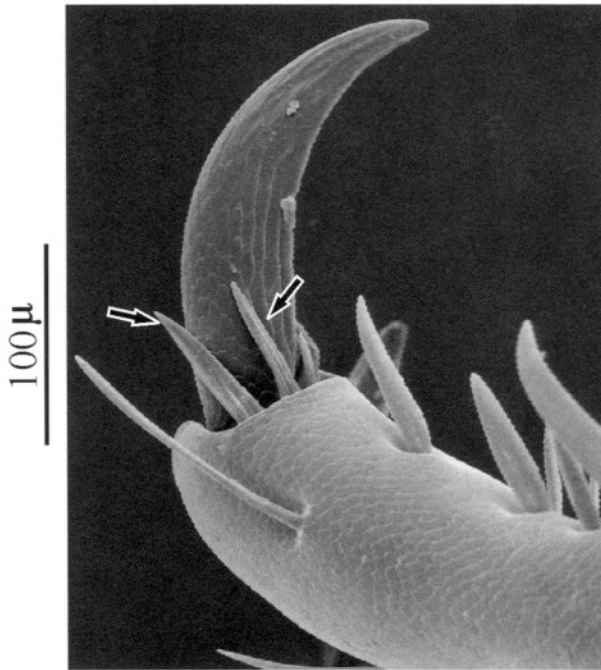


Figure 5. Apical tarsomere and claw showing two setae at claw base in *Trirammatus selkirki*.

the base of each tarsal claw in *Trirammatus* species is likely a synapomorphy for the genus (Will 2004). No doubt *Plagioplatys* is closely allied to *Trirammatus* and may prove to be congeneric with it, which may render the number of setae at the claw base homoplasious.

Based on the evidence presented above, the following changes are made: *Trirammatus selkirki* (Andrewes), **comb. nov.** for *Pterostichus selkirki* Andrewes, 1931 (Fig. 6A); *Trirammatus skottsbergi* (Andrewes), **comb. nov.** for *Pterostichus skottsbergi* Andrewes, 1931 (Fig. 6B); and *Trirammatus ignobilis* (Chaudoir) **comb. nov.** for *Feronia ignobilis* Chaudoir, 1876 (Fig. 6C).

The more complicated taxonomic history and study of the type series for *T. ignobilis* revealed issues which need clarification regarding this species. Chaudoir (1876) originally described this species in *Feronia* Latreille, 1817 together with discussion and description of many Chilean taxa now distributed in *Parhypates* Motschulsky, 1865, *Argutoridius* Chaudoir, 1876, etc. Subsequently Csiki (1930:584) proposed the combination *Argutoridius ignobilis*, which was then eliminated by Straneo's (1969:252) synonymy of *Pterostichus walkeri* Andrewes (1931) with *Feronia ignobilis* Chaudoir as a species of *Pterostichus*. Chaudoir described his species from one male and two females collected by Germain. Based on these specimens he described this species as notably sexually dimorphic, with males having broadly expanded lateral margins of the elytra and females being of the normal form. Andrewes's (1931) description of *P. walkeri*, which was based on four individuals including both sexes, however, makes no mention of any sexual difference. Straneo (1969) examined only one specimen of the type series of *P. ignobilis*, the single male of the series in the MNHN collection. I examined the type series and found that the first specimen is indeed a male (Fig. 6C) with modified elytra and is clearly conspecific with *P. walkeri*. I have designated this specimen as the lectotype. The next two

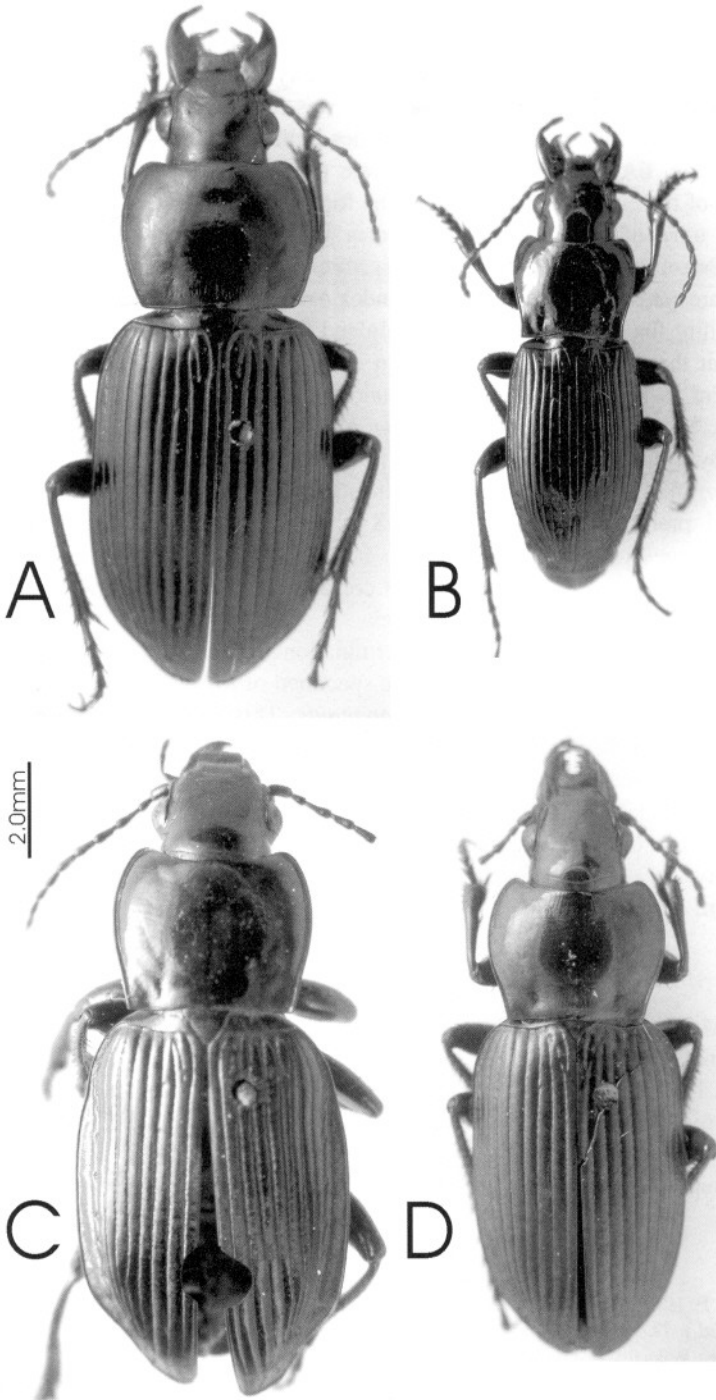


Figure 6. Dorsal habitus of A. *Trirammatus selkirki*. B. *Trirammatus skottsbergi*. C. Lectotype of *Feronia ignobilis* Chaudoir. The dorsal hole in the elytra is dermestid damage. The remains of the male genitalia were removed and mounted on a point below the specimen. D. One of the females included in Chaudoir's type series for *T. ignobilis* but representing a different *Trirammatus* species.

specimens are females (Fig. 6D) that have unmodified elytra. There is a fourth specimen that is not part of the type series; this is a female with modified elytra. This last specimen was labeled "Juan Fernández Isl/Walker.", exactly the same label data as the BMNH syntypes, and was in the Bates collection. This was certainly added after the publication of the description of *T. ignobilis*. The two females in the type series are somewhat similar to *T. selkirki* (Fig. 6A), but the notably sinuate pronotum and complete lack of a lateral broadening of the elytra separates them. The form of these female specimens is also quite unlike the only other *Trirammatus* species known from the islands, *T. skottsbergi* (Fig. 6B). Presently I cannot assign these specimens to any species. It is unknown if these specimens are actually from the Juan Fernández Archipelago as no locality data is available. The possibility that these are Chilean mainland *Trirammatus* species remains. It is also possible that these specimens represent an extinct or extant undescribed island species.

Subsequent to Straneo's synonymy, catalogs have included *T. ignobilis* in the genus *Parhypates* Motschulsky, 1865 (e.g., Lorenz 1998). However, this was not initially suggested by Straneo (1969) nor was it presented in his later (Straneo 1986) treatment of *Parhypates*. This species shares no significant morphological similarities to *Parhypates* species and preliminary analyses of 28S ribosomal DNA sequences for Harpalinae exemplars suggests no close relationship between *Parhypates* and the euchroine taxa (Will, unpublished data). Those data also corroborate the morphological data presented above, supporting these taxonomic changes

In my attempt to assign a specific determination to the two female specimens in the *T. ignobilis* type series I examined the type specimen of *Pterostichus guerini* Waterhouse, 1841, currently placed in the genus *Trirammatus*. This species is neither a member of *Pterostichus* nor *Trirammatus*, but rather conspecific with *Loxandrus dubius* (Curtis 1839). Like other South American *Loxandrus* LeConte, 1852 this species has a single setae subtending each claw and a single dorsal puncture in the third elytral interval; it lacks the angular base of stria one and has a complete, straight metacoxal sulci that are ended apicolaterally. *Pterostichus guerini* Waterhouse is synonymized under *Loxandrus dubius* (Curtis), **syn. nov.**

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#### LITERATURE CITED

- Andrewes, H. E. 1931. Coleoptera-Carabidae of the Juan Fernandez Islands, pp. 629-637. In: C. Skottsberg (Ser. Ed.). *The Natural History of the Juan Fernandez and Easter Islands*. Volume 3. Uppsala, Aluquist Wiksells Boktyckeri.
- Chaudoir, M. de. 1876. Carabiques du Chili. *Annales de la Société Entomologique de Belgique* 19:105-124.
- Csiki, E. 1930. Carabidae II: Harpalinae IV, pp. 529-738. In: S. Schenkling (Ed.) *Coleopterorum Catalogus auspiciis et auxilio*. Part 112. Volume 2. W. Junk, Berlin.
- Emden, F.L., van. 1958. New South American Carabidae (Coleoptera) with notes on described species. *Annals and Magazine of Natural History* 1(13):19-32.



- ICZN. 1999. *International Code of Zoological Nomenclature* (4th ed.). International Trust for Zoological Nomenclature. The Natural History Museum, London, 306 pp.
- Liebherr, J. K. & K. W. Will. 1998. Inferring phylogenetic relationships within Carabidae (Insecta, Coleoptera) from characters of the Female Reproductive Tract, pp. 107–170. In: G. E. Ball, A. Casale & A. Vigna Taglianti [Eds.], *Phylogeny and classification of Caraboidea (Coleoptera: Adephaga)*. dal Bollettino del Museo Regionale di Scienze Naturali, ATTI, Torino.
- Lorenz, W. 1998. *Nomina carabidarum—a directory of the scientific names of ground beetles. (Insecta, Coleoptera “Geadephaga”: Trachypachidae and Carabidae incl. Paussinae, Cicindelinae, Rhysodinae)*. Published by the author, Hormannstrasse 4, D-82327 Tutzing, Germany.
- Moore, B. P. 1965. Studies on Australian Carabidae (coleoptera) 4- The Pterostichinae. *Transaction of the Royal Entomological Society of London* 117:1–32.
- Straneo, S. L. 1957. Los insectos de las Islas Juan Fernandez: 36. Carabidae (Coleoptera) (supplement). *Revista Chilena de Entomología (Santiago)* 5:445–449.
- Straneo, S. L. 1969. Revisione del genere *Argutoridius* Chaudoir. *Memorie Societa Entomologica Italiana* 48:249–262.
- Straneo, S. L. 1977. Chiavi per la determinazione dei generi e sottogeneri dei Pterostichini dell’America del Sud (Coleoptera Carabidae). *Bollettino della Società Entomologica Italiana* 109:104–116.
- Straneo, S. L. 1979. Notes about classification of the south American Pterostichini with a key for determination of subtribes, genera and subgenera (Coleoptera: Carabidae). *Quaestiones Entomologicae* 15:345–356.
- Straneo, S. L. 1986. Sul gen. *Parhypates* Motschulsky (Coleoptera, Carabidae). *Atti. Società Italiana di Scienze Naturali Museo Civico di Storia Naturale di Milano* 183:221–236.
- Straneo, S. R. Jeannel. 1955. Los insectos de las islas Juan Fernandez 23. Carabidae (Coleoptera). *Revista Chilena de Entomología (Santiago)* 4:121–144.
- Will, K. W. 2000. *Systematics and Zoogeography of Abariform genera (Coleoptera: Carabidae: Pterostichini), and a phylogenetic hypothesis for pterostichine genera*. Entomology, Cornell University, Ithaca, New York, pp. 289.
- Will, K. W. 2002. Revision of the new world abariform genera *Neotalus* n. gen. and *Abaris* Dejean (Coleoptera: Carabidae: Pterostichini (Auctorum)). *Annals of the Carnegie Museum of Natural History* 71:143–213.
- Will, K. W. 2004. A remarkable new species of *Trirammatius* Chaudoir (Coleoptera: Carabidae: Pterostichini) from the Valdivian forest of Chile. *Zootaxa* 758:1–9.

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