Leiopus taeniatus (Gmelin, 1790) (Coleoptera, Cerambycidae) – a misidentified species and forgotten name

TORSTEIN KVAMME, HENRIK WALLIN & MIKAEL SÖRENSSON

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This study shows that *Leiopus taeniatus* (Gmelin, 1790) (Coleoptera, Cerambycidae) is not a junior subjective synonym of *Leiopus nebulosus* (Linnaeus, 1758) but a senior subjective synonym of *Leiopus punctulatus* (Paykull, 1800), as revealed by Ivan I. Lepyokhin's (Lepechin's) original diagnosis and illustration of an unnamed "*Cerambyx*" beetle in his 1768–1772 expedition itinerary, subsequently adopted and explicitly named as *Cerambyx* (*Stenocorus*) *taeniatus* in Gmelin (1790) and here re-interpreted. No type or any other specimens from before 1900 labelled as *L. taeniatus* has been found and the type is considered lost. We consider *Leiopus taeniatus* a forgotten name (**nomen oblitum**) and invalid since it has not been used as valid after 1899. Consequently, its junior synonym *Leiopus punctulatus* (Paykull, 1800) should be considered the valid name and, accordingly, a **nomen protectum**. Both *L. taeniatus* (Gmelin, 1790) **synonymum novum** and its senior objective synonym *L. bifasciatus* (Goeze, 1777) (invalid homonym) should be listed under *L. punctulatus* (Paykull, 1800) as invalid synonyms and *Leiopus linnei* Wallin, Nylander & Kvamme, 2009 resurrected as a valid name.

Key words: Coleoptera, Cerambycidae, *Leiopus*, *taeniatus*, *linnei*, *punctulatus*, *nebulosus*, taxonomy, nomenclature, Lepyokhin, Lepechin, nomen oblitum, nomen protectum, resurrection of name, new synonym.

Torstein Kvamme, Norwegian Institute of Bioeconomy Research (NIBIO), P.O. Box 115. NO-1431 Ås, Norway. E-mail: torstein.kvamme@nibio.no

Henrik Wallin, Department of Zoology, Swedish Museum of Natural History, Box 50007, SE-10405 Stockholm, Sweden. E-mail: bhrwallinare@gmail.com

Mikael Sörensson, Biological Institute, Lund university, Sölvegatan 37, SE-22362 Lund, Sweden. E-mail: mikael.sorensson@biol.lu.se

Introduction

In 1768–1772, the Russian traveller and explorer Ivan I. Lepyokhin (1740–1802) (Lepechin in German, hereafter used), contemporary and friend of the famous Peter Simon Pallas, headed an expedition through the Volga region, the Urals and northern European Russia. Seemingly, somewhere in the Urals (West Siberia), Lepechin collected a cerambycid beetle in a stone crevice ("*Habitat Sibiriae in petrarum fissuris*"), subsequently diagnostically described and illustrated (though not named) in his travel itinerary, first published in Russian in 1772, later translated into German (Lepechin 1775). Soon after, Goeze (1777) and Gmelin (1790) independently and based

on Lepechin's German translation provided a name to the species, Gmelin's younger name (*Cerambyx taeniatus*) thereby automatically becoming a junior objective synonym of Goeze's older name since both names were applied to the same (unnamed), identical specimen. Unfortunately, Goeze chose an already occupied name (*Cerambyx bifasciatus*) which rendered it a primary homonym and thus invalid. Neither name was subsequently used as valid, and they gradually fell into oblivion. In modern catalogues, they were cited (if at all mentioned), as synonyms under *Leiopus nebulosus* (Linnaeus, 1758), e.g. Löbl & Smetana (2010: 209). Fairly recently, and based on ecological, morphological and genetic evidence, *L. nebulosus* was split into two, budding off the closely related sibling *L. linnei* Wallin, Nylander & Kvamme, 2009 (Wallin *et al.* 2009).

Danilevsky & Tavakilian (2022) regarded *Leiopus linnei* to be a junior synonym of *Leiopus taeniatus* (Gmelin, 1790), solely based on the assumption that the sibling species *L. nebulosus* does not occur in Siberia. Lepechin (1775: 199–200) (Figure 1, 2) did not provide a specific location of the record, but his travel report indicates that the locality was in the Ural area of West Siberia. *Cerambyx taeniatus* was stated as found "*in a stone crevice*". Gmelin (1790: 1863) copied the information and stated that the specimen was from "Siberia". No specimens labelled as *L. taeniatus* by Lepechin or Gmelin have been found, and the only material Danilevsky & Tavakilian (2022) referred to is the sketchy drawing in Lepechin (1775: Taf. 11, Fig. 32) (Figure 4). To clarify the situation surrounding these species, we surveyed the history behind the name of *L. taeniatus.* The aim of our study is to clarify misunderstandings in interpretation of the historical information available and provide a satisfactory solution to opposing views on this matter.

Material and methods

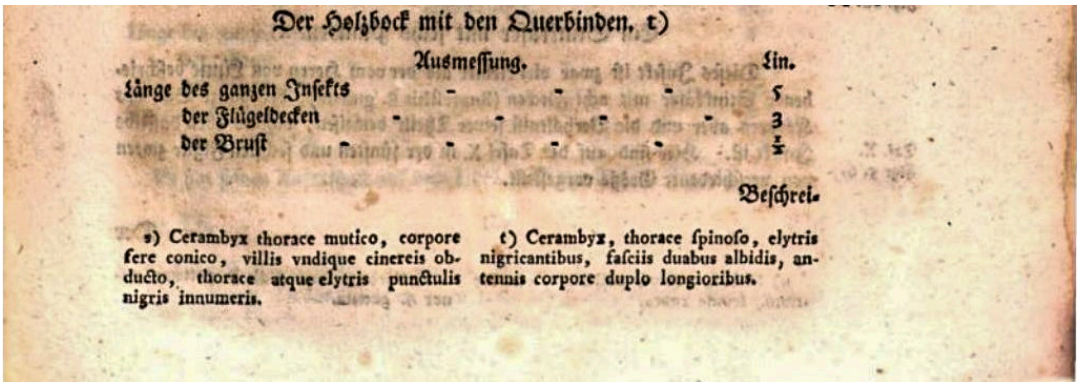
A literature study, from Lepechin's works up to the present, was carried out. In addition, various internet sources were thoroughly studied. Correspondence with specialists contributed to solving many problems and unanswered questions concerning type specimens.

All references to the original descriptions of *Leiopus* species have been added as a historical documentation, although "auctor, year" is not a reference strictly speaking. The references to the original description of genera are not included. Nomenclature of genera is outside the scope of this paper.

History of *Leiopus taeniatus* in a taxonomic context

The description of *Cerambyx taeniatus* by Gmelin (1790) (Figure 3) in Latin was copied word-by-word from the original description by Lepechin (1775: 199) (Figure 1): "*C. thorace spinoso, elytris nigricantibus, fasciis duabis albidis, antennis corpore duplo longioribus".* Gmelin is the auctor since Lepechin described the species but did not introduce a species name. Lepechin (1775: 200) (Figure 2) also made a detailed description of *Cerambyx taeniatus* in German as a part of the diagnosis, which Gmelin (1790) did not refer to. It reads (translated from German): *The head is small and black. The thorax clearly has two spines on the sides, also black. The antennae which have each ten segments are two times the body length, each segment is white halfway from the base and black to the apex. The elytra are black, with four bands across; the first band at the beginning of the elytra is black; then a white band, with very small, injected black dots; in the middle runs a narrow black band (stripe) across the elytra; and the rear part is covered by a white band across, also with small, black dots marked. The whole underside is black with a greyish tinge.*

Lepechin clearly stated that the head and the pronotum are black, and the entire venter is black tuning into greyish. It is evident that Ivan Lepechin considered it to be a small, blackened longhorn beetle with two white, transverse bands on the elytra, and with antennae 2 times longer than the body. In contrast, the head, pronotum and venter in *L. nebulosus* and *L. linnei* are brown, not black, and the antennae are only 1.5 times longer than the body (Wallin *et al.* 2009). Thus, we



Der Holzbock mit den Querbinden. t)

Ausmeſſung. Lin.

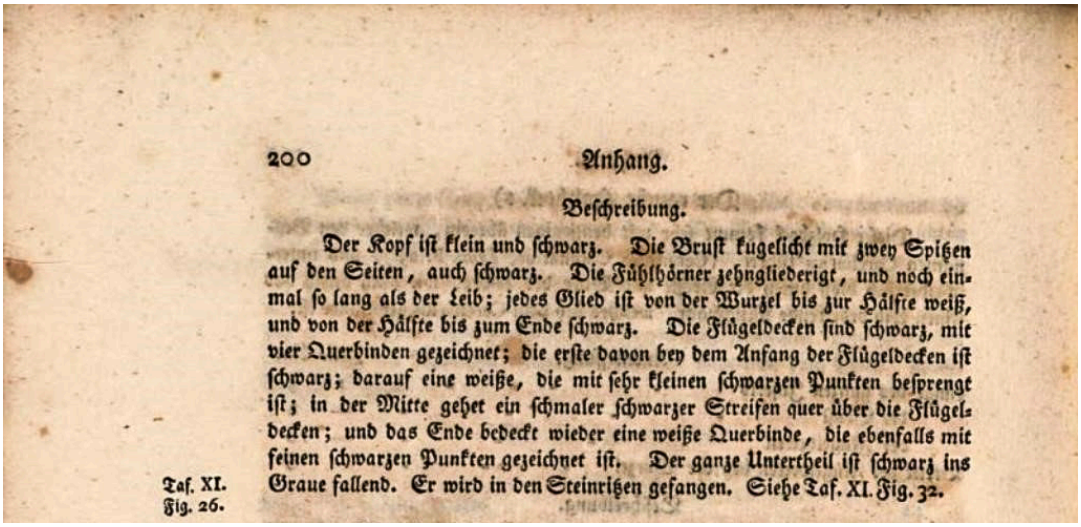
Länge des ganzen Inſekts - - - - - 5
der Flügeldecken - - - - - 3
der Bruſt - - - - - ½

Beſchrei.

s) Cerambyx thorace mutico, corpore fere conico, villis vndique cinereis obducto, thorace atque elytris punctulis nigris innumeris.

t) Cerambyx, thorace ſpinoſo, elytris nigricantibus, faſciis duabus albidis, antennis corpore duplo longioribus.

FIGURE 1. The original description in Latin by Lepechin (1775: 199) (lower right side under t)), later named *Cerambyx taeniatus* Gmelin, 1790.



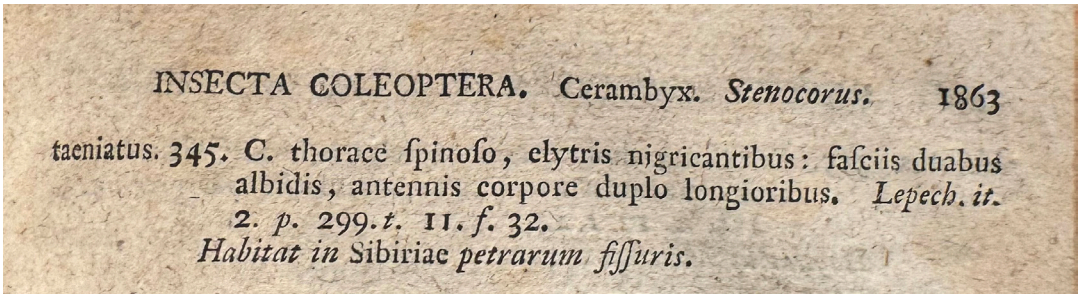
200 Anhang.

Beſchreibung.

Der Kopf iſt klein und ſchwarz. Die Bruſt kugelicht mit zwey Spitzen auf den Seiten, auch ſchwarz. Die Fühlhörner zehngliederigt, und noch einmal ſo lang als der Leib; jedes Glied iſt von der Wurzel bis zur Hälfte weiß, und von der Hälfte bis zum Ende ſchwarz. Die Flügeldecken ſind ſchwarz, mit vier Querbinden gezeichnet; die erſte davon bey dem Anfang der Flügeldecken iſt ſchwarz; darauf eine weiße, die mit ſehr kleinen ſchwarzen Punkten beſprengt iſt; in der Mitte gehet ein ſchmaler ſchwarzer Streifen quer über die Flügeldecken; und das Ende bedeckt wieder eine weiße Querbinde, die ebenfalls mit feinen ſchwarzen Punkten gezeichnet iſt. Der ganze Untertheil iſt ſchwarz ins Graue fallend. Er wird in den Steinritzen gefangen. Siehe Taf. XI. Fig. 32.

Taf. XI. Fig. 26.

FIGURE 2. The description and diagnosis in German of an unnamed cerambycid in the travel diary of Lepechin (1775: 200) later named as *Cerambyx taeniatus* by Gmelin (1790: 1863).



INSECTA COLEOPTERA. Cerambyx. *Stenocorus.* 1863

taeniatus. 345. C. thorace ſpinoſo, elytris nigricantibus: faſciis duabus albidis, antennis corpore duplo longioribus. *Lepech. it. 2. p. 299. t. 11. f. 32.*
Habitat in Sibiriae *petrarum fiſſuris.*

FIGURE 3. The original description of *Cerambyx taeniatus* Gmelin, 1790: 1863. He copied the description by Lepechin (1775: 199) (cf. figure 1).

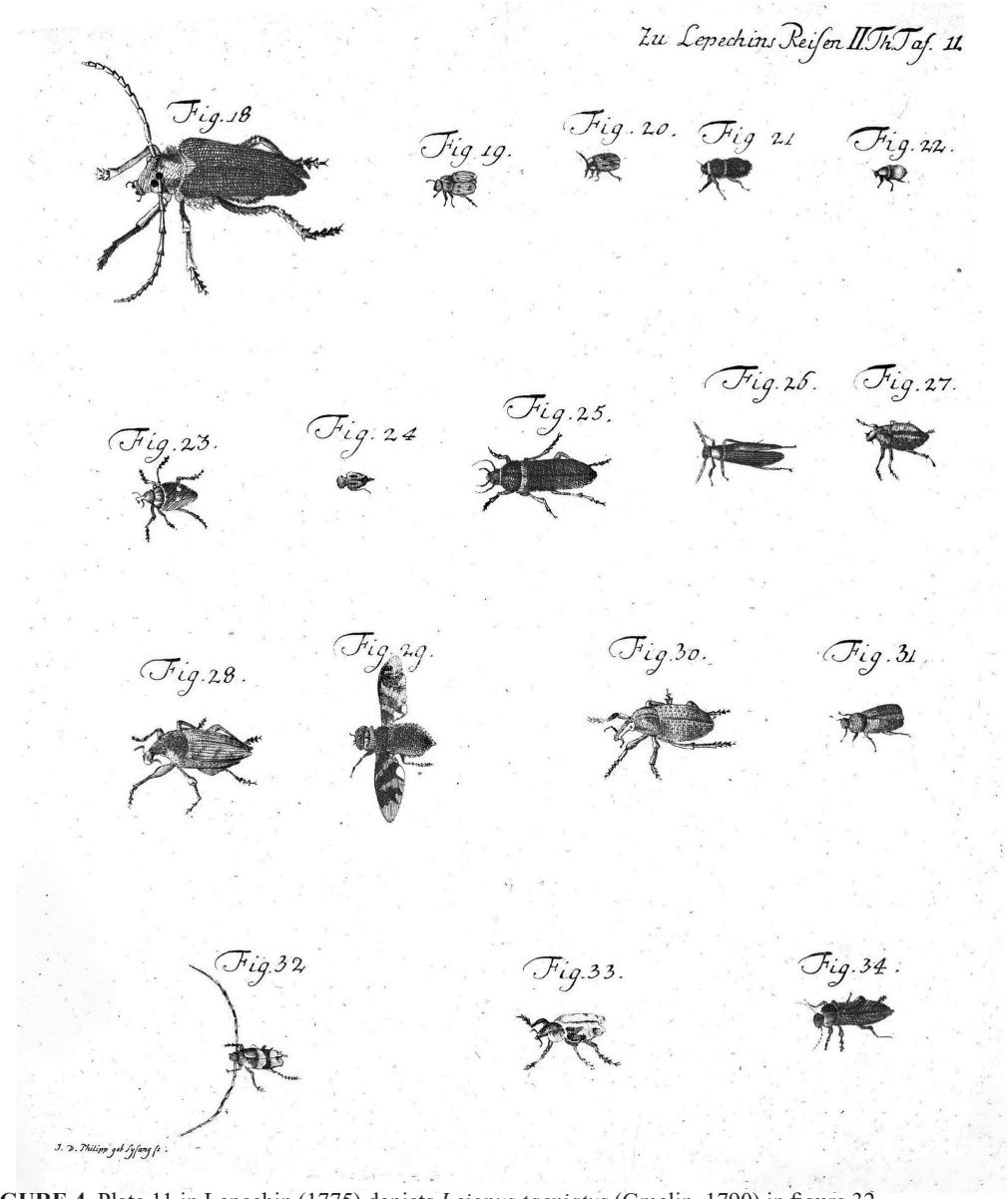
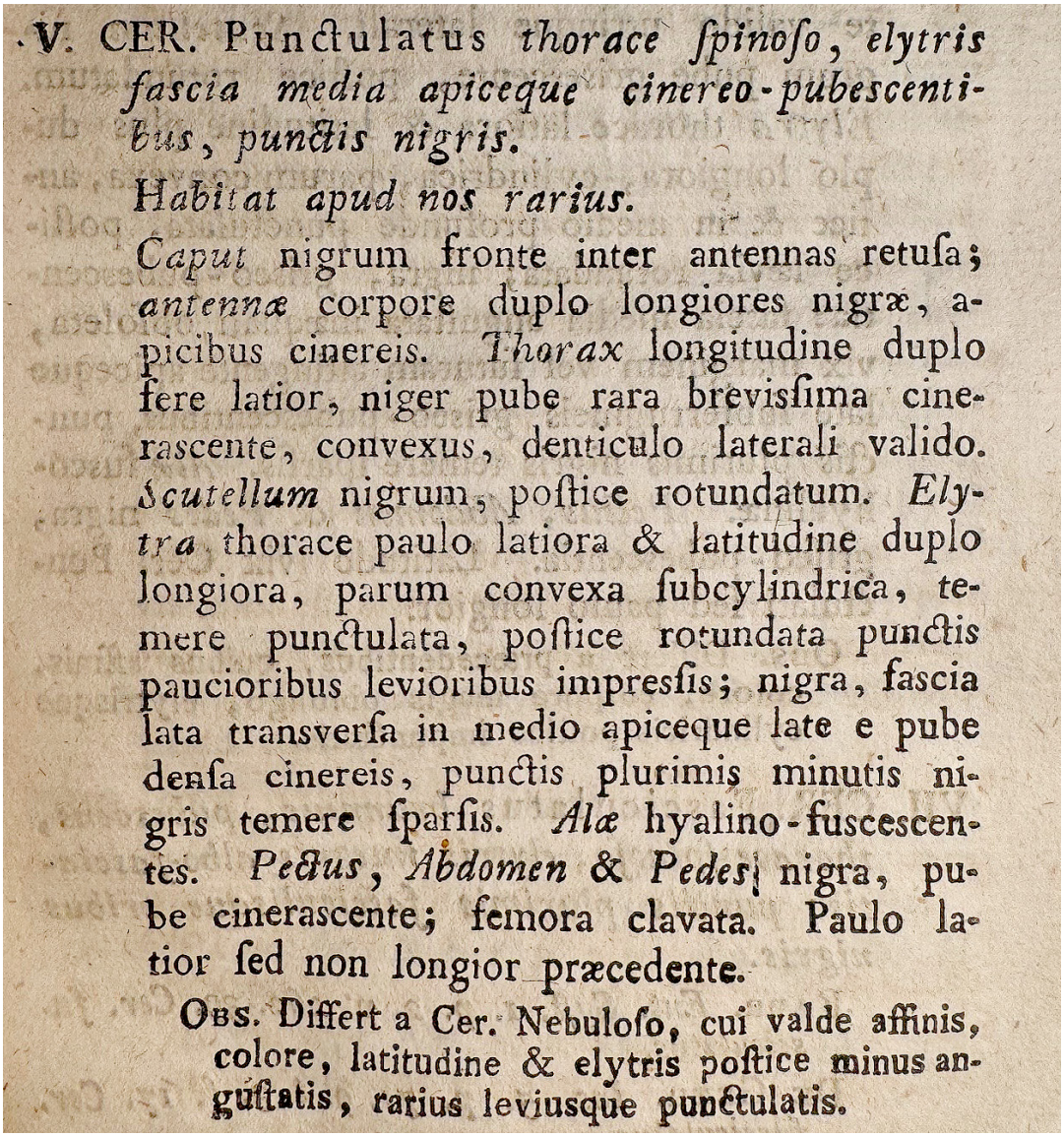


FIGURE 4. Plate 11 in Lepechin (1775) depicts *Leiopus taeniatus* (Gmelin, 1790) in figure 32.

consider *Cerambyx taeniatus* to be a black species of *Leiopus* (*cf.* Kraatz 1879). Consequently, Lepechin´s description in German corresponds very well with the rare species *Leiopus punctulatus* (Paykull, 1800).

This information was overlooked by Wallin et al. (2009) and some other authors, e.g. Aurivillius (1921), Breuning (1963), Löbl & Smetana (2010), Danilevsky (2020) and Danilevsky & Tavakilian (2022). The drawing in Lepechin (1775: Tab. 11, Fig. 32) (Figure 4) is not very accurate, but long antennae and the absence of an ovipositor reveals it as a male specimen. Long antennae, blackened head and pronotum, and two distinct white bands on the elytra combined with spines on the thorax are typical for *L. punctulatus*. However, without reading Lepechin's diagnosis in German, it could easily be mistaken for *L. nebulosus*, which often



V. CER. Punctulatus *thorace ſpinoſo, elytris fascia media apiceque cinereo-pubescentibus, punctis nigris.*

Habitat apud nos rarius.

Caput nigrum fronte inter antennas retuſa; *antennæ* corpore duplo longiores nigræ, apicibus cinereis. *Thorax* longitudine duplo fere latior, niger pube rara brevisſima cinerascente, convexus, denticulo laterali valido. *Scutellum* nigrum, poſtice rotundatum. *Elytra* thorace paulo latiora & latitudine duplo longiora, parum convexa ſubcylindrica, temere punctulata, poſtice rotundata punctis paucioribus levioribus impresſis; nigra, fascia lata transverſa in medio apiceque late e pube denſa cinereis, punctis plurimis minutis nigris temere ſparſis. *Alæ* hyalino-fuscescentes. *Pectus, Abdomen & Pedes* nigra, pube cinerascente; femora clavata. Paulo latior ſed non longior præcedente.

Obs. Differt a Cer. Nebuloſo, cui valde affinis, colore, latitudine & elytris poſtice minus anguſtatis, rarius leviusque punctulatis.

FIGURE 5. The page with the original description of *Leiopus punctulatus* (Paykull, 1800: 57).

has a distinct black band on the middle of elytra. The original description of *Leiopus punctulatus* by Paykull (1800: 57) (Figure 5) is similar in most respects to Gmelin´s description of *L. taeniatus*. Both Lepechin and Paykull included the presence of black spots on the white (*sensu* Lepechin) or greyish (*sensu* Paykull) bands on elytra, which also corresponds well with *L. punctulatus*. In fact, the Latin word "punctulatus" denotes presence of "small punctures" or "dots". *Leiopus punctulatus* develops under bark on branches, mainly of *Populus tremula* L., which is abundant in Russia, including Siberia. (cf. below under distribution).

Translation of Paykull's original description of *Cerambyx punctulatus* (Figure 5).

[Diagnosis] "Cer.[ambyx] Punctulatus *with spinose thorax, elytra with medial and apical bands of*

greyish pubescence, with black dots. Rarely found by us [Sweden]."

[Description] *"Head black, frons between antennae blunt, antennae of double body length, black, apically grey. Thorax breadth about double its length, black, with sparse, very short, greyish pubescence, convex, with large lateral denticle. Scutellum black, rounded posteriorly. Elytra slightly broader than thorax, their length double their breadth, somewhat convex, subcylindrical, randomly punctulate, rounded posteriorly, with fewer, more superficial punctures; black, with broad transverse bands, medially and apically broadly greyish of dense pubescence, with numerous, randomly distributed, minute, black dots. Hind wings hyaline, darkened. Abdomen and legs black, with greyish pubescence; femora clavate. Slightly broader but not longer than preceding [species]."*

OBS. Differs from the very similar Cer. [ambyx] Nebulosus *by the colour, the breadth and by the elytra being posteriorly less attenuated, with sparser, lighter punctuation."*

There is another black *Leiopus* with antennae two times longer than the body and occurring from West Siberia to the Far East: *Leiopus albivittis* (Kraatz, 1879). However, *L. albivittis* (especially males) is smaller (body length 5–8 mm), more flattened and slenderer than *L. nebulosus*, *L. linnei*, *L. taeniatus* and *L. punctulatus,* all reaching at least 8–10 mm in body length. According to Ehnström & Holmer (2007) the body length of *L. nebulosus* is 6–10 mm and for *L. punctulatus* 5–10 mm, although the average body length is expected to be slightly shorter in *L. punctulatus* (Bense 1995). Lepechin (1775: 199) used "linien" or lines as a measure of body length (BL) which is an inaccurate measure today with a high degree of measurement errors, especially for smaller species, since the metric system was not yet introduced, and the length of one mm was unknown. We consider the BL of *Cerambyx taeniatus*, published by Lepechin as 5 linien, to equal the interval of 8–10 mm, especially if measured in the field. Lepechin's measurement of the larger species *Saperda carcharias* (Lepechin 1775: 199) is more precise, since it is a larger species and fits the rough measurement of "linien" much better.

The anterior silver-grey band on the elytra of *L. albivittis* is broken, i.e. black laterally and medially creating a very distinct "V-shaped" black pattern, and the posterior silver-grey band is very narrow. This distinctly differs from *L. punctulatus* and the diagnosis by Lepechin (1775: 199–200, Fig. 32). Other potential candidates among species of *Leiopus* occurring in Siberia (or Asia) are not black and differ significantly from *L. punctulatus* and *L. albivittis* (Wallin *et al.* 2012). The Siberian species *Leiopus stillatus* (Bates, 1884) occurs only in the Far East. It is greyish with numerous black dots on the entire elytra, lacks the anterior black band on the elytra, and has short antennae only 1.5 times longer than the body (Wallin et al. 2012). In addition, all small species of the genus *Acanthocinus* Dejean, 1821 that have been considered do not have black integument, and males have antennae much longer than twice as long as the body (Wallin *et al.* 2012).

Distribution of *Leiopus punctulatus* and its host tree

Ivan I. Lepechin´s second volume of his published diary from 1775 comprises the expedition to the southern and middle parts of the Ural Mountains, including visits to both Yekaterinburg and Orenburg. The Ural Mountains are, at least, part of West Siberia and transgress towards the West Siberian plain. It was not until 1774–1775 that Lepechin explored further east into Siberia. Both *L. punctulatus* and *L. nebulosus* are recorded from the Central European territory in Russia (Löbl & Smetana 2010), bordering to the Ural Mountains in the east. In fact, there is a recent record of *L. punctulatus* (4.VII.2008; collector unknown) close to the western parts of the Ural Mountains (Izhevsk), some 200 km SW of Perm and some 400 km W of Yekaterinburg, on the eastern parts of the Ural Mountains (GBIF 2024a). The preferred host tree, *Populus tremula* (Lundberg & Martin 1991), is common in the Ural Mountains, except for the most northern part (GBIF 2024b). Lepechin (1775) did not mention any specific locality for *C. taeniatus* while Gmelin (1790) stated: "*Habitat in*

Siberia". It is reasonable to assume Ural as place of discovery, like in other species mentioned, e.g. *Saperda carcharias* (L.) (Lepechin 1775: 199). In any case, we will never know exactly where Lepechin collected *L. taeniatus* other than it was most likely in the southern or middle parts of Ural.

Availability of type specimens

The type of *L. taeniatus* (Gmelin, 1790) is considered lost. The collection of Ivan Lepyokhin (Lepechin), if it ever existed, is considered lost and was not included in Horn & Kahle (1935) or in Horn *et al.* (1990). If any insects were incorporated into the collection of P. S. Pallas. they were lost during a fire in the Zoological Museum in St. Petersburg (Horn & Kahle 1935). Gmelin (1790) often introduced his own names to species already described (Vane-Wright 1975) and described many other species from already published works with available diagnoses in Latin, such as Lepechin (1775), where a binominal species name was lacking (Spilman 1967). Gmelin rarely, if ever, described new species from his own material. Spilman (1967) wrote: "*unfortunately it is likely that all of the new species were based entirely on published information, rather than on specimens*". When Gmelin (1790) refers to a specific work such as "Mus. Lesk.". theoretically there is a chance of finding preserved specimens (Spilman 1967, Vane-Wright 1975). Nathanel Gottfried Leske collected a large number of insects (Museum Leskeanum), which was catalogued and published by Zschach (1788), subsequently reiterated and included in Karsten (1789). There is, however, no specimen of *Cerambyx taeniatus* listed by Zschach (1788) or Karsten (1789). The Leske collection was later sold and included in the collections of the Natural History Museum in Dublin (Horn & Kahle 1935), but only Lepidoptera has been thoroughly investigated with labelled specimens from the Leske collection identified (Vane-Wright 1975). In the mid-1800s, the Leske insects were integrated into the main collection, and in most cases, they were not labelled as such (pers. com. Aidan O'Hanlon, Curator of Entomology, National Museum of Ireland, Dublin). When Gmelin (1790) introduced other species names to already described species, he often referred to DeGeer, e.g. No. 354 *Cerambyx* (*Stenocorus*) *pensylvanicus* Gmelin, 1790. This is today considered a junior synonym of *Graphisurus fasciatus* (DeGeer, 1775). The type of *Graphisurus fasciatus* is present in the DeGeer collection preserved at Naturhistoriska Riksmuseet, Stockholm (NHRS). The original label written by DeGeer together with a new label for the currently accepted name and the synonym described later by Gmelin is attached. It is also registered in the database at NHRS where Gmelin thus is mentioned. However, there is no Gmelin collection, or any types described by Gmelin preserved at NHRS (pers. com. Niklas Apelqvist, curator at NHRS) other than types initially described by other auctors, such as Charles DeGeer. Although understandable from the point of objective synonymies, it is still surprising that the type of *L. taeniatus* and some other Gmelin types are listed in the Titan Cerambycidae Database (Titan 2024) as located in the collections of NHRS.

Catalogue with comments on nomenclature

Leiopus nebulosus (Linnaeus, 1758)
nebulosus Linnaeus, 1758: 391 (*Cerambyx*)
niger Geoffroy, 1762: 204 (*Cerambyx*): **unavailable name**; specific name suppressed (Hemming 1954).
Note: In our view, the body length and original description given does not contradict an association with *Leiopus nebulosus* as interpreted of today.
monilis Geoffroy, 1785: 75 (*Cerambyx*): **synonymum confirmavit.**
Note 1: In our view, the body length and original description given does not contradict an association with *Leiopus nebulosus* as interpreted of today.
Note. 2: *Cerambyx nebulosus sensu* Geoffroy (1785: 77) *nec* Linnaeus (1758: 391) (**misidentification**) is far too small (1 ⅔ ligne = circa 3,7 mm) to fit the modern concept of *L. nebulosus*. Geoffroy's description hints towards some small cerambycid beetle, possibly a species of the genus *Pogonocherus* Dejean, 1821.
fasciatus Villers, 1789: 239 (*Cerambyx*): **Homonym** sensu Danilevsky & Tavakilian (2022), without specifying what kind of homonymy and to what name.
dissimilis Pic, 1889: 5: **Junior synonym.**
unifasciatus Pic, 1891: 23 (*Liopus*): **Junior synonym.**

siculus Pic, 1924: 22 (*Liopus*): **Junior synonym.**

Leiopus linnei Wallin, Kvamme & Nylander, 2009
linnei Wallin, Kvamme & Nylander, 2009: 39 **species restituta.**
Note: As outlined in this paper, we do not find any evidence for the synonymy of *L. linnei,* and *L. nebulosus* as suggested in Danilevsky & Tavakilian (2022: 131). Therefore, *Leiopus linnei* is re-established as a valid species name.

Leiopus punctulatus (Paykull, 1800)
bifasciatus Goeze, 1777: 464 (*Cerambyx*) [*nec Cerambyx bifasciatus* Linnaeus, 1767: 624] **junior primary homonym**.
taeniatus Gmelin, 1790: 1863 (*Cerambyx*) junior objective synonym (of *L. bifasciatus* (Goeze)); senior subjective synonym (*nomen oblitum*) **synonymum novum.**
Note: The description of Goeze (1777: 464) is identical to Gmelin's (Gmelin 1790) and Gmelin apparently simply copied it. Both refer to Lepechin's itinerary, description and plate in an identical way indicating identical type material and denoting nominal taxa with the same name-bearing type, thereby making *Leiopus taeniatus* (Gmelin, 1790) a junior objective synonym of the invalid *L. bifasciatus* (Goeze, 1777). Although Lepechin's original material probably is lost, indirect evidence (description, plate illustration, geographic location, ecology) speaks in favour of the synonymy as presented here. Since *Leiopus taeniatus* has not been used as a valid name since 1899, it may be considered a forgotten name (*nomen oblitum*); *cf.* article 23.9.2 (ICZN 1999). Consequently, *Leiopus punctulatus* (Paykull) (*nomen protectum*) takes precedence over its invalidated senior synonym *L. taeniatus* (ICZN 1999, article 23.9.2). The recent attempt to revalidate *L. taeniatus* (Danilevsky & Tavakilian 2022), was obviously based on a misidentification and cannot be taken in consideration as for validation of long forgotten names. We conclude that *Leiopus punctulatus* (Paykull, 1800) (*nomen protectum*) is the valid name for *L. taeniatus* (Goeze, 1790) (*nomen oblitum*) and that *Leiopus linnei* should be resurrected as a valid name.
punctulatus Paykull, 1800: 57 (*Cerambyx*) junior subjective synonym (*nomen protectum*).
Note: Valid name; *vide* discussion under *taeniatus* above.

Discussion

Schönherr (1817: 376) was probably the first to synonymize *L. taeniatus* with *L. nebulosus*. He referred to Lepechin's "Tageb. II, p. 199, Tab. 11, f. 32" and the 13th edition of "Systema Naturae" (Gmelin 1790) amongst synonyms of *L. nebulosus*, although he did not include the name *C. taeniatus*. He referred to Lepechin's work, but under "*Cerambyx parvus tigriformis* Voet. Col. ed. Panz. III. p. 12.4. T. 4. f. 4.", listed as a synonym of *L. nebulosus.* Possibly, Schönherr relied on Fabricius' works and ignored the work by Gmelin as a consequence. Spilman (1967) wrote: *"Perhaps the absence of citations to Gmelin in insect literature today is primarily due to Fabricius. I scanned Fabricius' post Gmelin works and did not see a reference to Gmelin".* Much later, Aurivillius (1921: 405-406) formally introduced *L. taeniatus* as a junior synonym of *L. nebulosus* by referring to Gmelin (1790). It is likely that Aurivillius also had access to Gmelin´s work and could link the work of Lepechin to *C. taeniatus* as referred to by Gmelin.

L. taeniatus has been incorrectly placed as a synonym of *L. nebulosus* for more than 200 years. Danilevsky and Tavakilian (2022) reintroduced *L. taeniatus* as a valid name for *L. linnei*. As shown in the present paper, *L. taeniatus* is not a junior synonym of *L. nebulosus* but identical with the species *L. punctulatus.* The conclusion is that *L. linnei* Wallin, Nylander & Kvamme, 2009 **species restituta** is resurrected as a valid species. No use of the name *L. taeniatus* as a valid species name after Gmelin (1790) have been found after 1899. According to ICZN (1999: article 23.9.2), *L. taeniatus* is a **nomen oblitum** *"*a forgotten name*"* and cannot be used as the valid name. Consequently, *L. punctulatus* (Paykull, 1800) should be considered the valid name and a **nomen protectum**.

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