



Corrections, additions, and nomenclatural notes to the recently published World catalog of fossil and subfossil Lepidoptera

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Sohn *et al.* (2012) recently published an annotated catalog of lepidopteran fossils, which was the first attempt to compile all the known fossil specimens, described or undescribed, from the world literature. This publication provided paleontological data such as fossil type, specimen deposition, excavation locality, fossil host plants, and geological age for at least 4,568 specimens, including 229 described fossil species. As originally intended, the catalog already elicited correspondence with various specialists who found errors that the authors were unaware of. We are confident that usefulness of the catalog increases with such feedback. In this article, we provide an update to correct the errors in the publication, together with new information found since the catalog was published, including one new synonym (*Baltopsyche* Sohn, 2012, **syn. nov.** = *Sucinopsyche* Sobczyk, 2011); the proposed change of the nominal *Zygaenites* to a collective group name; and the resurrection of *Satyrites* Scudder, 1872 over *Lethites* Scudder, 1875.

Corrections

In Sohn *et al.* (2012), there were a few erroneous page number or publication year citations of the original descriptions and also misspellings in taxon names. Corrections to these errors are shown in Table 1. In Sohn *et al.* (2012), the bibliographic references to Skalski (1973c) and Crane and Jarzembowski (1980) were unintentionally omitted; the bibliographic source of *Jupiteria* Scudder, 1881 and Rebel (1936) were incorrectly cited. For the corrections, see the reference section of this article.

TABLE 1. Corrections to Sohn *et al.* (2012).

page	it reads	it should read	remarks
27	<i>ADELITES</i> Rebel, 1934a: 373	<i>ADELITES</i> Rebel, 1934a: 15	wrong citation of page number
43	<i>ARGYRESTHITES</i> Rebel, 1934a (Argyresthiidae): 5	<i>ARGYRESTHITES</i> Rebel, 1934a: 5 (Argyresthiidae)	incorrect order of information
52	<i>innominatus</i> Kusnezov, 1941: 50, figs. 35–36	<i>innominatus</i> Kusnezov, 1941: 50, figs. 35–36 (<i>Paraborkhausenites</i>)	original generic combination missing
56	<i>castinoides</i> Tindale	<i>castnioides</i> Tindale	incorrect spelling of species name
65	<i>Satyrites</i> Scudder, 1872: 66	<i>Satyrites</i> Scudder, 1872: 71	wrong citation of page number
65	<i>reynesii</i> Scudder, 1872: 66, pl. 7	<i>reynesii</i> Scudder, 1872: 71, pl. 7	wrong citation of page number
66	<i>sepulta</i> Boisduval, 1840: 371, pl. 8	<i>sepulta</i> Boisduval, 1841: [273], pl. 8	wrong citation of publication year; the page number of the original description erroneously printed as '371' (actually '273')
66	<i>PSEUDONEORINA</i> Nel and Descimon, 1994	<i>PSEUDONEORINA</i> Nel and Descimon, 1986	wrong citation of publication year

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TABLE 1. (Continued)

page	it reads	it should read	remarks
66	<i>coulleti</i> Nel and Descimon, 1994	<i>coulleti</i> Nel and Descimon, 1986	wrong citation of publication year
68	= <i>Jupiteria</i> Scudder, [1881] 1883: 290.	= <i>Jupiteria</i> Scudder, [1881] 1883: 280.	wrong citation of page number
68	<i>Lithopsyche</i> Scudder, 1889: 454	<i>Lithopsyche</i> Scudder, 1889: 452	wrong citation of page number
68	<i>styx</i> Scudder, 1889: 454, pl. 53: 11, 16, 17	<i>styx</i> Scudder, 1889: 454, pl. 52: 11, 16, 17	wrong citation of plate number
71	cf. <i>maackii</i> Ménétriés, 1859	cf. <i>maackii</i> Ménétriés, 1858	wrong citation of publication year
71	<i>BELENOIS</i> Hübner, 1825	<i>BELENOIS</i> Hübner, 1819	wrong citation of publication year

Additions

1. Unidentified lepidopteran trace fossils in Currano *et al.* (2010) are missing in Sohn *et al.* (2012). This record needs to be added to the ‘Lepidoptera *incertae sedis*’ section of Sohn *et al.* (2012) as follows:

—Currano *et al.* 2010: 557-559 (lepidopteran leaf mines)

CI & T (leaf mine)/USNM (not stated)/ USA: Wyoming, southern Bighorn Basin (Willwood Fm.)/Ypresian, Early Eocene.

2. The generic name *Lithopsyche*, afterwards replaced by *Lithodryas* to avoid homonymy, appeared first in Scudder ([1881] 1883) and was described later (Scudder, 1889). According to the ICZN (1999), Scudder’s 1881 record is unavailable as it lacks a description. This aspect is missing in Sohn *et al.* (2012: 68) and needs to be added as follows.

LITHODRYAS Cockerell, 1909: 79. A replacement name for *Lithopsyche* Scudder, 1889.

= *Lithopsyche* Scudder, [1881] 1883: 280. Invalid name.

= *Lithopsyche* Scudder, 1889: 452.

Type species: *Lithopsyche styx* Scudder, 1889. A junior homonym of *Lithopsyche* Butler, 1889 [Lepidoptera: ?Riodinidae].

Nomenclatural notes

1. Gender of generic names

For compound genus-group names ending in the suffix ‘-ites’, Sohn *et al.* (2012) treated the gender of such genera as masculine, according to the ICZN (1999: Art. 30.1.4.4). The authors, however, neglected to notice the exceptions mentioned in the same article, namely the cases when the author of the compound genus-group name stated that it had another gender or treated it as feminine or neuter by combination with an adjective species name in that gender form. In those exceptional cases, the original spelling of the species name should be maintained. The genders of the following fossil genera were defined by the original authors with feminine or neuter species name endings which were unnecessarily changed by Sohn *et al.* (2012). The resulting corrections in species name endings are shown in brackets.

Adelites Rebel, 1934, defined as feminine [*acutitarsella* (nec *acutitarsellus*); *electreella* (nec *electreellus*); *serraticornella* (nec *serraticornellus*)].

Argyresthites Rebel, 1934, defined as feminine [*balticella* (nec *balticellus*); *succinella* (nec *succinellus*)].

Incurvarites Rebel, 1934, defined as feminine [*alienella* (nec *alienellus*)].

Noctuities Heer, 1849, defined as feminine [*effosa* (nec *effosus*); *caucasica* (nec *causicus*); *deperdita* (nec *deperditus*); *incertissima* (nec *incertissimus*); *maxima* (nec *maximus*); *miocenica* (nec *miocenicus*); *stavropolica* (nec *stavropolicus*)].

Note: Heer (1849) included two species, *haidingeri* and *effosa*, under *Noctuities* whose gender seems to be defined as feminine, given the ending of the latter species. Later when describing another species of *Noctuities*, he used a masculine ending (i.e. *deperditus*) which is emended here.

Nymphalites Scudder, 1889, defined as neuter [*obscurum* (nec *obscurus*)].
Pamphilites Scudder, 1875, defined as feminine [*abdita* (nec *abditus*)].
Phalaenites Heer, 1849, defined as feminine [*obsoleta* (nec *obsoletus*); *crenata* (nec *crenatus*)].
Scythropites Rebel, 1936, defined as feminine [*balticella* (nec *balticellus*)].
Thanatites Scudder, 1875, defined as feminine [*vetula* (nec *vetulus*)].
Thaites Scudder, 1875, defined as feminine [*ruminiana* (nec *ruminianus*)].

The generic name *Tineitella* was proposed by Fletcher (1940) as a replacement for *Tineites* Kawall, 1876 which is a junior homonym of *Tineites* Germar, 1842. The gender of *Tineitella* was not specified by the author and is indeterminable from the endings of combined species names. It is, however, obviously feminine according to the gender of the suffix ‘-ella’. The change of the ending in *sepositella* to *sepositellus* as suggested by Sohn *et al.* (2012) is therefore unnecessary. Likewise the name *sucinacius* Kozlov, 1987 needs to be emended to ‘*sucinacia*’.

2. Status of generic names ending in ‘-ites’

The suffix ‘-ites’ is commonly, but not exclusively, used for collective-group names of fossils whose only taxonomic association can be determined above the genus level or for nominal fossil genera exhibiting similarity to an extant genus. The former names do not need type-species fixations to be available (ICZN, 1999: Articles 13.3.2; 42.3.1; and 67.14) but the latter do. In practice, however, it is often hard to tell one group of names from the other unless authors explicitly stated their intentions. For the generic names ending in ‘-ites’, Sohn *et al.* (2012) discussed only the possible collective-group names but not the nominal genus-group names. Collective-group names are discernable when the authors stated them explicitly as such; or when the name includes fossils which are diagnosable only at family level. At least 11 genera were very likely defined as collective-group names and they include: *Elachistites* Kozlov, 1987; *Geometridites* Kernbach, 1967; *Gracillariites* Kozlov, 1988; *Noctuites* Heer, 1849; *Nymphalites* Scudder, 1889; *Oecophorinites* Kozlov, 1988; *Phalaenites* Heer, 1849; *Plutellites* Kozlov, 1988; *Psychites* Kozlov, 1988; *Sphingidites* Kernbach, 1967; and *Tortricites* Kozlov, 1988. *Stigmellites* Kernbach, 1967 was originally proposed as an ichnotaxon to accommodate trace fossils which show no generic affinity within Nepticulidae. The genus was later regarded as a collective-group name by Jarzembowski (1989) and Kozlov (1988). Of fossil genera ending in ‘-ites’, discerning them as nominal genus-group names is somewhat tricky. We regarded the fossil genera as nominal when the authors explicitly stated their diagnostic characters in comparison with other fossil or extant genera. Such diagnoses sometimes became available by the actions of subsequent researchers. Twenty seven genera fall into these criteria: *i.e.* *Adelites* Rebel, 1934; *Arctiites* Rebel, 1898; *Argyresthites* Rebel, 1934; *Borkhausenites* Rebel, 1934; *Cerurites* Kernbach, 1967; *Doritites* Rebel, 1898; *Depressarites* Rebel, 1936; *Dysmasiites* Kusnezov, 1941; *Epiborkhausenites* Skalski, 1973; *Eriocranites* Kernbach, 1967; *Gallerites* Kernbach, 1967; *Incurvarites* Rebel, 1934; *Lethites* Scudder, 1875; *Lycaenites* Rebel, 1898; *Microsymmocites* Skalski, 1977; *Mylothrites* Scudder, 1875; *Neoborkhausenites* Skalski, 1977; *Oegoconiites* Kusnezov, 1941; *Oligamatites* Kusnezov, 1928; *Palaeoscardites* Kusnezov, 1941; *Pamphilites* Scudder, 1875; *Proscardites* Kusnezov, 1941; *Pyrallites* Heer, 1856; *Scythropites* Rebel, 1936; *Symmocites* Kusnezov, 1941; *Thaites* Scudder, 1875; and *Thanatites* Scudder, 1875. Three genera: *Bombycites* Heer, 1849, *Pierites* Heer, 1849; and *Tineites* Kawall, 1876 (preoccupied and replaced by *Tineitella* Fletcher, 1940), were originally proposed as nominal genus-group taxa but later changed to collective-group names with heterogeneous or non-diagnostic fossils subsequently incorporated (e.g., Heer, 1865 for *Bombycites*; Kozlov, 1988 for *Pierites* and *Tineites*). *Zygaenites* Burgeff, 1951 was proposed as a nominal genus-group name but is unavailable due to the lack of a description (ICZN, 1999: Article 13.3). We propose to make it available by changing it into a collective-group name indicating fossils which show some evidences of zygaenid association. Such a change is allowed by the ICZN (1999: Article 23.7.2).

3. Subsequent type designations

Several old works describing new fossil genera lacked statements about their type species in the original descriptions. Such genera require subsequent type species fixations to become available (ICZN, 1999: Articles 13.3 and 69), unless they are collective-group names. Sohn *et al.* (2012) briefly discussed this issue for some fossil genera but overlooked the unjustified subsequent type species fixations for six fossil genera: *Cerurites* Kernbach, 1967; *Eriocranites* Kernbach, 1967; *Gallerites* Kernbach, 1967; *Pyrallites* Heer, 1856; *Sphingidites* Kernbach, 1967; and *Stigmellites* Kernbach, 1967. Each of these was established for a single species and thus their type species were automatically fixed by monotypy (ICZN, 1999: Article 68.3). Sohn *et al.* (2012) stated that the type species of *Pierites* Heer, 1849, was subsequently designated by Hemming (1967). This statement is inappropriate since Hemming (1967) did not propose a subsequent type designation for the genus. Heer (1849) established the genus by monotypy and thus

the type species was already fixed. As Sohn *et al.* (2012) noted, the genus *Pierites* is now used as a collective-group name. The ICZN (1999: Article 67.14) establishes “If the name of a nominal genus-group taxon is subsequently applied to a collective group, the type species of that taxon is disregarded while the name is used as a collective-group name.” From this provision, the type species of *Pierites* is disregarded. Likewise, the type species of the monotypic *Sphingidites* should also be disregarded. *Geometridites* and *Phalaenites* were originally defined as collective-group names and thus their subsequent type fixations are unnecessary.

The original description of *Depressarites* Rebel, 1936 was given as a form combined with the species description. Fixation of *Depressarites levipalpella* Rebel as the type species of the genus was first proposed by Nye & Fletcher (1991) who followed the third edition of the ICZN (1985). According to the fourth edition (ICZN, 1999: Article 13.4), the type species of *Depressarites* is automatically fixed with *Depressarites levipalpella* from the original description.

4. Availability of *Satyrites*

Satyrites was first established by Scudder in 1872 as a genus-group name, by implication with the genera *Debis* Doubleday, 1849 and *Cyllo* Boisduval, 1832 (= *Melanitis* Fabricius, 1807). The genus was later replaced with *Lethites* by Scudder (1875) who thought that his older genus was a junior homonym of *Satyrites* Blanchard & Brullé, 1840. This replacement, followed by Sohn *et al.* (2012), turned out to be erroneous. The supposed homonym *Satyrites* Blanchard & Brullé was actually proposed for a family-group taxon (see Hemming, 1967: 254, 402). Therefore, *Satyrites* Scudder, 1872, is an available and valid name. To reflect this aspect, the account of *Lethites* in Sohn *et al.* (2012) must be changed as follows:

SATYRITES Scudder, 1872: 66. **stat. rev.**

Type species: *Satyrites reynesii* Scudder, 1872.

= *Lethites* Scudder, 1875a: 265. Unnecessary replacement name (see Hemming, 1967: 254).

= *Lethites* Scudder, 1875b: 34. Subsequent citation.

= *Latyrites* [sic]; Brodie, 1873: 17.

5. New synonym

Baltopsyche was proposed by Sohn in Sohn *et al.* (2012) as a replacement name for *Palaeopsyche* Sobczyk and Kobbert, 2009 which is a junior homonym of *Palaeopsyche* Perkins, 1905. This proposal is however invalid as Sobczyk (2011) had already introduced a replacement name, *Sucinopsyche*, prior to Sohn *et al.* (2012) for the genus. Therefore, *Baltopsyche* becomes a junior objective synonym of *Sucinopsyche*. To accommodate this change, the account (Sohn *et al.* 2012: 37) regarding *Baltopsyche* needs to be updated as follows:

SUCINOPSYCHE Sobczyk, 2011: 309.

= **PALAEOPSYCHE** Sobczyk and Kobbert, 2009: 17. A junior homonym of *Palaeopsyche* Perkins, 1905 [Lepidoptera: Epipyropidae].

Type species: *Palaeopsyche secundum* Sobczyk and Kobbert, 2009.

= **BALTOPSYCHE** Sohn in Sohn *et al.*, 2012: 37. **syn. nov.** An unnecessary replacement name for *Palaeopsyche* Sobczyk and Kobbert, 2009.

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The references already cited in Sohn *et al.* (2012) are not shown to avoid redundancy, unless discussed in the text.

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