

The type material of Swedish bees (Hymenoptera, Apoidea) IV. Bees from Thomson's collection

L. ANDERS NILSSON

Nilsson, L.A.: The type material of Swedish bees (Hymenoptera, Apoidea) IV. Bees from Thomson's collection [Typpmaterial av svenska bin (Hymenoptera, Apoidea) IV. Bin från Thomsons samling.] – Entomologisk Tidskrift 131 (1): 73-94 Uppsala, Sweden 2010. ISSN 0013-886x.

This report presents the fourth part of the results of a taxonomic revision and examination of the actual, reputed or potential type material of bees of Swedish origin. Focus is on the status, depository, type locality, condition and history of name-bearing specimens. Here, 35 bee taxa based on material in the collection of the leading Swedish entomologist Carl Gustaf Thomson (1824 – 1899) have been examined. After a biographical sketch of Thomson and a summary of his contribution on bees and his legacy, lectotypes are designated for the specific taxa (bold= valid epithet) *Colletes picistigma* Thomson, 1872, *Hylaeus clathratus* Thomson, 1870, *H. genalis* Thomson, 1872, *H. marginatus* Thomson, 1870, *Andrena curvungula* Thomson, 1870, *A. integra* Thomson, 1870, *A. morawitzi* Thomson, 1872, *A. nasalis* Thomson, 1870, *A. nigrospina* Thomson, 1872, *A. violascens* Thomson, 1870, *Sphecodes crassus* Thomson, 1870, *Megachile curvicrus* Thomson, 1872 (now subspecies of *M. nigriventris* Schenck), *M. lapponica* Thomson, 1872 and *Epeolus glacialis* Alfken, 1913 (here identified as a distinct subspecies, **stat. nov.**, of *E. alpinus* Friese). Already labelled but unpublished lectotypes of *Hylaeus submarginatus* Thomson, 1872, *Andrena albo-fasciata* Thomson, 1870, *Epeolus productus* Thomson, 1870 and *E. rufipes* Thomson, 1870 are validated. Further taxa examined (including more syntypes designated whenever located) are *Andrena intermedia* Thomson, 1870, *Sphecodes pilifrons* Thomson, 1870, *S. puncticeps* Thomson, 1870, *S. reticulatus* Thomson, 1870, *Coelioxys obtusispina* Thomson, 1872, *Osmia claviventris* Thomson, 1872 (now *Hoplitis c.*), *O. truncatula* Thomson, 1872 (now subspecies of *O. leaiana* (Kirby)), *Nomada bifida* Thomson, 1872, *N. glabella* Thomson, 1870, *N. laeta* Thomson, 1870, *N. punctiscuta* Thomson, 1870, *N. 5-spinosa* Thomson, 1870, *N. rufilabris* Thomson, 1870, *N. villosa* Thomson, 1870, *Apathus lisonurus* Thomson, 1872, *Bombus arenicola* Thomson, 1872 and *B. brevigena* Thomson, 1870 (now subspecies of *B. wurflenii* Radoszkowski). The typifications and validations define authentic material, type localities and establish correct synonymies, e.g., *Andrena violascens* Thomson is a synonym of *A. fulvida* Schenck, 1853.

L. Anders Nilsson, Department of Plant Ecology, EBC, Uppsala University, Norbyvägen 18 D, SE-752 36 Uppsala, Sweden, E-mail: anders.nilsson@ebc.uu.se

Taxa are basic in Biology. Stability in the use of names of taxa promotes timeless communication on matters of conservation, ecology and distributional trends. This report contains the fourth part of the results of a critical examination of the actual, reputed or potential type material of Swedish bees. A review of the history of the scientists and their described number of taxa as well as a

description of the materials and methods used during the present studies were presented in part I (Nilsson 2007a). The reader should consult that paper for more information on the general scope and technical details of the work. Part II provided two neotypifications and part III dealt with another 21 taxa (Nilsson 2008, 2009). The present contribution focuses on bee taxa described



Figure 1. Carl Gustaf Thomson, sharp-eyed Swedish world class entomologist (portrait ca. 1870 and in Mölle by Kullaberg in Skåne prob. ca. 1880). As Thomson allegedly had a child with his house wife, his supreme application for the Curator position at the National Natural History Museum in Stockholm was unsuccessful due to the capital noblesse. Courtesy of R. Danielsson (ZML).



Carl Gustaf Thomson, skarpögd svensk entomolog av världsklass. Eftersom Thomson ryktesvis hade barn med sin hushållerska bemöttes hans överlägsna ansökan för intendenturen vid riksmuseet kallsinnigt p.g.a. moralväktarna inom huvudstadsnoblessen.

by the most sharp-eyed, skilful and productive Swedish entomologist of all times, Carl Gustaf Thomson (1824 – 1899). A short biographic presentation (partly selected and adapted from Bengtsson (1900) of this world-class scientist is given here.

Carl Gustaf Thomson

Thomson (Fig. 1) was born in Mellan-Grevie parish S of Malmö and lived and died in Lund, Skåne. He came as a student to Lund University in 1843. Due to an unusual intellectual capacity paired with extreme devotion for painstaking entomological scientific work his academic career soon took pace. He became a Ph.D. in

1850 and Associate Professor in 1857. In 1862 he was appointed Curator of the entomological collections. Thomson's restless productivity was enormous and, altogether, it resulted in over 8800 pages of systematics and species descriptions. He published on all major insect groups but with main emphasis on the Coleoptera, and especially the most difficult, interesting and unexplored one – the Hymenoptera. A theme in his work was to express the phylogenetic, "natural", relationships between taxa.

Thomson spent a lot of time on walking tours and collected most of the studied insects himself in various parts of Skåne. As was the usual practice of the time, insects were pinned alive

directly in the field. Numerous collecting trips also went to other provinces. His collections grew immense and reflected an in-depth work on the national fauna. He described thousands of new taxa, in the Hymenoptera alone well over 2000 species. During the course of the work also the Swedish bee fauna was monographed (1869a, 1869b, 1870a, 1870b, 1870c, 1870d, 1872, 1888). Although Thomson did not linger on this group, 35 new specific taxa of bees were described. Sixteen of these are presently valid either as species or subspecies. He increased the known Swedish bee fauna by 40%.

As highlighted in the recent systematic overview of the bees of the world (Michener 2007: 77-78): "Thomson (1872) made a classification that in various ways is more modern than those of earlier writers...Except for the association of *Epeolus*, *Nomada*, and the parasitines with *Melecta*, Thomson put the parasitic bees where they belong – *Sphcodes* in the halictids, the megachilid parasites in the Megachilidae, and *Psithyrus* with *Bombus*. For the first time, *Halictus* appeared in a major taxon different from that of *Andrena*; *Colletes* and *Hylaeus* were in the same tribe, along with *Rophites*, and the melittids were among what are frequently called the anthophorines, i.e., the noncorbiculate Apidae". A discovery of general relevance was that parasitic bee taxa can be associated with their nonparasitic relatives.

As Thomson said himself, "I did not have the gift to temporize with my conviction and have a soft back". With integrity he "did it my way" due to an unusual fortitude and strength of mind. He was extremely passionate with his research; for it he lived and sacrificed everything. He never married but allegedly had a child with his house wife. The latter circumstance disqualified him (informally) for the position as Curator at the National Natural History Museum in Stockholm 1883, although having a supreme application. All Thomson could spare from his own comparably low salary was used to cover printing costs for the long, scientifically monumental series of fascicles in "*Opuscula Entomologica*". In the history of Swedish entomology Thomson's star shines the brightest, for his country and university.

The Thomson legacy

Thomson's collections are today and in the future of central importance to European environmental research. With the authentic material of thousands of taxa, especially parasitic Hymenoptera, the collections constitute much of the basis for the knowledge of European biodiversity. This fact paired with the alarming biodiversity crisis give Lund University precedence in forming a national centre of excellence in taxonomic and conservational biodiversity research. It is often so "that no one is prophet in his own country", but due to Thomson a top European centre of biodiversity has its given location in Lund. A loss of the collections, by whatever reason, would be nothing more than a devastating blow against Swedish environmental research – this is an elementary fact that cannot be denied.

Material and methods

Thomson, like many of his nineteenth century colleagues, lacked a nomenclatural type concept and never explicitly designated or labelled any type material. Thus any modern taxonomical actions involving his taxa, e.g. typification, must be based on the text in his original publications and the authentic material preserved in the Zoological Museum in Lund. For the recognition of type material and on the selection and designation of lectotypes in relation to Coll. Thomson, the present work principally applied the same approach as outlined in the general part of the account on Thomson's described 957 nominal species of Ichneumonidae by Fitton (1982).

For easy access of the essential information on each taxon the presentation has been organized into two paragraphs. The first paragraph constitutes a mini-summary in one single sentence with five parts due to semicolon divisions (this format is adjusted whenever relevant, e.g., in cases of non-existing data). The five parts mention the taxonomical status, type locality, original labelling, quality and identity of the name-bearing specimen studied (see Nilsson 2007a for details). The second paragraph presents the background and taxonomical considerations. It also provides the necessary data and express statement to accompany any typification according to the current nomenclatural rules (see www.iczn.org/iczn, or ICZN 1999).

In cases with authentic material that has already been type-labelled but without published typification, I have accepted the chosen material and simply validate the designation (by the present publication) unless the material is suboptimal. In case a previous typifying author mentioned a certain number of authentic specimens studied and more authentic specimens were subsequently discovered, I have labelled the latter specimens as syntypes (following the advice of C.D. Michener and M. Schwarz pers. comm. 2008). Also, if a typifying author has mentioned a certain number of type specimens studied but it was here discovered that only one or two of these by whatever reason have been type-labelled by that author, I have labelled the remaining unlabelled specimens of the type series as syntypes (rather than paralectotypes; cf. ICZN Articles 73.2.2 and 74.1.3).

The abbreviations of institutions mentioned in the text denote:

NHBM = Natural History Museum, London (former British Museum),

NHRS = Swedish Museum of Natural History, Stockholm,

ZML = Zoological Museum, Lund,

ZMU = Museum of Evolution, Uppsala (former Zoological Museum, Uppsala).

The examined taxa have been arranged alphabetically below family and in Apidae below subfamily. The families and subfamilies of bees follow Michener (2007). Swedish names of bees are according to Nilsson & Cederberg (2008). Information on the present-day distribution of taxa is based on data collected within the Swedish WildBee Project (abbreviated below as SWBP) and stored at the Swedish Species Information Centre (ArtDatabanken), Swedish University of Agricultural Sciences (SLU), Uppsala.

Results

COLLETIDAE

Colletes picistigma Thomson 1872: 165

Lectotype ♀ ZML [here designated]; SWEDEN, Skåne län, Lunds kn, Fågelsång, 55.43N/13.20E; Fsg 13/8 / *picistigma* [hand, C.G. Thomson]; excellent, complete; *Colletes similis* Schenck, det. L.A. Nilsson 2008.

The taxon was described from both sexes

found in Gotland and Skåne. Below the cabinet species label *picistigma* in Coll. Thomson (ZML) there stand 11 specimens (10♀ 1♂) arranged in three rows (4+4+3). Seven specimens (6♀ 1♂) qualify as syntypes. A syntype ♀ standing left in the uppermost row bears Thomson's handwritten label "*picistigma*". The specimen is here selected as lectotype and labelled so. The remaining six specimens are here labelled as paralectotypes. Their original labelling reads "Ilsp 11/8" (= Ilstorp (♂), "G." (= Gotland) (2♀ ♀), "F 7/8" (= Fågelsång) (2♀ ♀) and "Scan" (= Skåne) (♀). That *C. picistigma* Thomson is a junior synonym of *C. similis* Schenck, 1853 was previously presumed (Blüthgen 1930: 891, Stoeckert 1933: 62, Noskiewicz 1936: 304, Elfving 1968: 10, Richards 1978: 135, Warncke 1978: 352, Vikberg 1986: 79, Erlandsson & al. 1988: 162, Schwarz & al. 1996: 22, Söderman & Vikberg 2002: 54). The lectotype and the paralectotype ♀♀ conform to the species *C. similis* Schenck while the paralectotype ♂ to *C. fodiensis* (Geoffroy) (as in e.g. Warncke 1978, Amiet & al. 1999). The typification provides authentic material and one type locality and validates the synonymy.

Hylaeus clathratus Thomson 1870d: 307.

Lectotype ♀ ZML [here designated]; SWEDEN, Skåne län, at Ringsjön, 55.50N/13.30E; small green subquadrate (ca. 3 x 2 mm) tag; good, except right antennal segments 2-12 lost; *Hylaeus rinki* (Gorski), det. L.A. Nilsson 2008.

The taxon was described from the ♀ only, and Thomson wrote explicitly "♂ mihi ignotus". He mentioned the locality as "vid Ringsjön i Skåne" (= at Ringsjön in Skåne). Below the cabinet species label "*Rinki*" in Coll. Thomson (ZML) there stand four specimens. Of these, only a pair is Swedish. The ♀ bears a green tag, the colour coding for the Ringsjön area. The specimen is here designated as lectotype and labelled so. The ♂ bears the following labelling: "Sm." (= Småland), "Bhn." (= leg. C.H. Boheman), "*Rinki* Gorski" (hand, C.G. Thomson) and "*chlathratus* m" (hand, C.G. Thomson). Indeed, Thomson soon wrote (1872: 133) that his *H. clathratus* was identical to *Hylaeus rinki* (Gorski, 1852). The synonymy has been listed for a century (Dalla Torre & Friese 1895: 24,

Dalla Torre 1896: 31, Warncke 1972: 767, Dathe 1980: 269, Erlandsson & al. 1988: 162, Schwarz & al. 1996: 17). The lectotype of *H. clathratus* conforms to the interpretation of *Hylaeus rinki* (Gorski) (as in e.g. Dathe 1980, Amiet & al. 1999). The typification validates the synonymy.

Hylaeus genalis Thomson 1872: 124.

Lectotype ♀ ZML [here designated]; SWEDEN, Skåne län, Lunds kn, surroundings of Lund, 55.43N/13.12E; small pink rhomboid tag/ *genalis* m [hand, C.G. Thomson]; excellent, complete; *Hylaeus gibbus* Saunders, det. L.A. Nilsson 2008.

The taxon was described from both sexes found in Skåne and Gotland. Below the cabinet species label "*genalis*" in Coll. Thomson (ZML) there stand six specimens arranged in two rows (5+1). All qualify as syntypes. The first, left specimen in the uppermost row is a ♀ bearing a small pink tag and Thomson's handwritten label "*genalis* m". The pink colour tag codes for the Lund area. The specimen is here selected as lectotype and labelled so. The remaining five specimens are here labelled as paralectotypes. Their respective original labelling is: "L. 7." (= Lund) (♂), "L-d" (= Lund) (♂), "G." (= Gotland) (♀), "Lund" (♀), and "Ld." (= Lund) (♀). That Thomson chose the epithet *genalis* reflects his skills; work a century later identified the length of the malar space, "gena", as the only really decisive character of the species (see Koster 1986). That *H. genalis* Thomson is a junior synonym of *H. gibbus* Saunders, 1850 has been presumed for almost a century (e.g. Alfken 1912a: 22, 1912b: 120, Forsius & Nordström 1921: 71, Jansson 1925: 144, Blüthgen 1930: 881, Stoeckert 1933: 57, Forsius 1935: 13, Méhely 1935: 147, Elfving 1951: 67, 1968: 9, Tjeder 1954: 69, Richards 1978: 135, Dathe 1980: 224, Vikberg 1986: 79, Erlandsson & al. 1988: 162, Schwarz & al. 1996: 14, Söderman & Vikberg 2002: 54). The lectotype of *H. genalis* conforms to the species *H. gibbus* (as in e.g. Dathe 1980, Koster 1986). The typification validates the synonymy.

Hylaeus marginatus Thomson 1870d: 306.

Lectotype ♀ ZML [here designated]; SWEDEN, Kalmar län, Öland; Ö. [printed]/ *marginatus* [hand, C.G. Thomson]; excellent, com-

plete; *Hylaeus difformis* (Eversmann), det. L.A. Nilsson 2008.

The taxon was described from both sexes and with Småland and Öland mentioned as localities. Below the cabinet species label "*marginatus*" in Coll. Thomson (ZML) there stand nine specimens arranged in three rows (5+3+1). The five specimens of the first row qualify as syntypes. The first, left specimen is a ♀ bearing Thomson's handwritten label "*marginatus*". This specimen is here selected as lectotype and labelled so. The other four specimens are here labelled as paralectotypes. They bear the original labelling "Ö." (= Öland) (♂) and a lilac rhomboid tag (= Småland, Kalmar) (1♂2♀). That *H. marginatus* Thomson is a junior synonym of *H. difformis* (Eversmann, 1852) was previously presumed (Dalla Torre & Friese 1895: 23, Dalla Torre 1896: 21, Schmiedeknecht 1907: 107, Warncke 1972: 756, Dathe 1980: 266, Erlandsson & al. 1988: 162, Schwarz & al. 1996: 13, Söderman & Vikberg 2002: 54). The lectotype of *Hylaeus marginatus* Thomson conforms to the current interpretation of the species *H. difformis* (Eversmann) (as in e.g. Dathe 1980, Amiet & al. 1999). The typification provides authentic material and one type locality and validates the synonymy.

Hylaeus submarginatus Thomson 1872: 130.

Lectotype ♀ ZML [examined and designation here validated]; SWEDEN, Gotlands län/kn, Gotland; G./ *submarginat* [hand, C.G. Thomson]; good, complete; *Hylaeus angustatus* (Schenck), det. L.A. Nilsson 2008.

The taxon was described from both sexes found on Gotland. Below the cabinet species label "*submarginatus*" in Coll. Thomson (ZML) there stand five specimens arranged in a single row. Three (2♀1♂) qualify as syntypes. The first, left, ♀ bears Thomson's handwritten label "*submarginat*" (sic!), a red label "Typ" and the label "*Prosopis angustata* Shck. (*submarginata* Ths.) det. R. Elfving". Elfving (1951: 79) wrote that he had seen four specimens of "der Thomsonischen *submarginata*" sent from Lund by K. Ander and stated that "sie mit *angustata* Schck synonym sind". Elfving mentioned however no typification action. The specimen labelled "Typ", probably by Elfving, is here accepted as



Figure 2. *Andrena curvungula* Thomson ♀ (13 mm). The species was described from Skåne, a province where it is now probably extinct (last seen 1948). Photo (on Gotland): L.A. Nilsson.

Blåklockesandbi ♀. Thomson beskrev arten från Skåne, ett landskap där arten nu sannolikt är utdöd (senast sedd 1948).

lectotype and labelled so. The remaining two specimens are here labelled as syntypes. Their original labelling is “G.” (= Gotland) (♀) and a black rhomboid tag (♂). The latter tag codes for coast and Gotland (B. Viklund pers. comm.). That *H. submarginatus* Thomson is a junior synonym of *Hylaeus angustatus* (Schenck, 1861) has been listed for long (Schmiedeknecht 1907: 109, Blüthgen 1930: 880, Forsius 1935: 13, Elfving 1951: 67, 1968: 8, Warncke 1972: 752, Dathe 1980: 258, Erlandsson & al. 1988: 162, Schwarz & al. 1996: 11, Söderman & Vikberg 2002: 54). The synonymy recorded by Elfving is here validated.

ANDRENIDAE

Andrena albo-fasciata Thomson 1870b: 154. Lectotype ♀ ZML [**examined and designation here validated**]; SWEDEN, Skåne län, Ystads kn, Sandhammaren, 55.24N/14.10E; ♀ [printed]/ Sandh. 26.7. 39. [hand, E. Munck af Rosenschöld]/ *albo-fasciata* [hand, C.G. Thomson]; good, beautiful, except right A3-12 lost; *Andrena albofasciata* Thomson, det. L.A. Nilsson 2005.

Thomson described the taxon on the basis of both sexes found “Sällsynt på Skånes sand-

marker” (= Rare on the sandy grounds of Scania). Below the cabinet species label “*albo-fasciata*” in Coll. Thomson (ZML) there stand 27 specimens arranged in seven rows (4+6(3 on the same pin)+4+4+4+4+1). Of these specimens, 24 qualify as syntypes. The third in the uppermost row is a ♂ of *Andrena gelriae* v.d. Vecht (det. A. wilkella Kirby by Niemelä in 1949; its genitalia checked and the determination revised by LAN in 2005) but the remaining 23 are conspecific. Niemelä (1949: 117) studied a total of “sechs weiblichen Typusexemplaren von Thomsons *A. albofasciata*” and listed the original labelling of all six in a footnote. He wrote “bei dem “*albo-fasciata*” bezettelten, als Lectoholotype zu betrachtenden Stück in Thomsons Sammlung” but did not mention any typification action. Niemelä’s considered lectoholotype (= a synonym, older term of lectotype) was found to be the left, first ♀ in the uppermost row and bears Thomsons handwritten label “*albo-fasciata*” and also the label “*Andrena albofasciata* Ths. (lectoholotypus) ♀ det. P. Niemelä 1949”. It is hereby accepted and validated that a lectotype has been designated by Niemelä. The remaining 23 specimens are here labelled as syntypes. They bear the original labelling: “Kfge” (= Käv-

Figure 3. *Andrena intermedia* Thomson ♀ (12 mm). The species was described from Norrland. Photo: L.A. Nilsson.

Rödklöversandbi ♀.
Thomson beskrev arten från Norrland, en landsdel där den är utbrett tämligen allmän - allmän.



linge) (4♂♂3♀♀), “flor P. kjfl 6 Sept” (= Kävlinge) (1♀), “Glf” (= Gualöv) (3♂♂), “Sjöbo” (1♂ *A. gelriae*, 1♀), “ar” (= Arrie) (2♂♂1♀ on the same pin), “Deg” (= Degeberga) (1♂), “L-d” (= Lund) (1♀), “Vtsk 25/8” (= Vittskövle) (1♀), “Lahm” (Laholm) (1♀) and “Scan” (= Skåne) (3♀♀). All the type specimens of *A. albofasciata* belong to the second generation of the species (LAN pers. obs.). The taxon has been highly controversial. Many have treated *A. albofasciata* as a junior synonym of *Andrena ovatula* (Kirby, 1802, *Melitta o.*) (viz. Warncke 1967: 206, 1986: 45, Richards 1978: 136, Janzon & Svensson 1984: 183, Vikberg 1986: 79, Dylewska 1987: 534, Svensson & al. 1990: 49, Monsevičius 1995: 40, Schwarz & al. 1996: 48, Gusenleitner & Schwarz 2002: 564) while many as a distinct species (viz. Stöckert 1930, Stöckert 1933: 149, Niemelä 1949: 118, Elfving 1968: 22, Schmid-Egger & Scheuchl 1997, Burger 2001: 35, Smissen 2001, Söderman & Vikberg 2002: 55, Nilsson 2003: 19, Söderman & Leinonen 2003: 97). The fact that in Germany there are two distinct flight phenologies separated by only ca. a month – thus too short for a life-cycle – and differences in morphology as well as in food-plant preferences (Stöckert

1930) makes it difficult from biological reasoning not to accept two species. In Sweden, the only known present is *A. albofasciata* Thomson (sensu Stöckert 1930), a species that is bivoltine and flies May – June and July – September with peaks, as expected, differing by ca. 2 months (LAN pers. obs.).

Andrena curvungula Thomson 1870b: 155.

Lectotype ♀ ZML [here designated]; SWEDEN, Skåne län; Sk. [printed]; heavily damaged, only the first three abdominal segments are left, sternite 1 is cracked and sternites 2nd and 3rd are hanging loose, segments 3-12 of both antennae, the left wing pair and both midlegs are lost and the right hindleg is hanging loose; *Andrena curvungula* Thomson, det. L.A. Nilsson 2008.

The species was described from both sexes found in “Skåne”. Below the cabinet species label “*curvungula*” in Coll. Thomson (ZML) there stand six specimens arranged in two rows (2♀♀1♂+1♀2♂♂). Two specimens (2♀♀) qualify as syntypes. The 2♀♀ are each standing left in a row. The labelling of the first includes “*curvungula*” in Thomson’s hand but (unfortunately, since the specimen is of perfect quality)

lacks any indication of locality. The second ♀ bears the original labelling “Sk.” (= Skåne) and conforms to the description and is here selected as lectotype and labelled so. It bears also a label which text has completely faded. The first ♀ is here labelled as paralectotype. The species (Fig. 2) seems to be extinct on mainland Sweden while rather common on Gotland (Nilsson 2005, and pers. obs. 2006). The typification provides authentic material and a type locality.

***Andrena integra* Thomson 1870b: 155.**

Lectotype ♀ ZML [**here designated**]; SWEDEN, Skåne län, Lunds kn, Lund, 55.43N/13.12E; ♀ [printed]/ Lund 4/6 37 [hand, A.G. Dahlbom]/ *integra* [hand, C.G. Thomson]; excellent, complete and beautiful, and without pollen; *Andrena chrysopyga* Schenck, det. L.A. Nilsson 2008.

The taxon was described on the basis of both sexes from Skåne. Below the cabinet species label “*integra*” in Coll. Thomson (ZML) there stand six specimens, 2♀♀4♂♂, arranged in two rows (3+3). All specimens qualify as syntypes. The left, first specimen in the uppermost row is a ♀ labelled as above including Thomson’s handwritten label “*integra*”. The specimen is here selected as lectotype and labelled so. The remaining five specimens are here labelled as paralectotypes. Their original labelling is: a small pink tag and “Ld” (= Lund) (1♀1♂), “L-d 25/6” (= Lund) (2♂♂), and “ar” (= Arrie) (1♂). That *A. integra* Thomson is a junior synonym of *A. chrysopyga* Schenck, 1853 was previously presumed (Schmiedeknecht 1882-1884: 790, Dalla Torre & Friese 1895: 42, Friese 1895: 200, Dalla Torre 1896: 109, Warncke 1967: 279, Dylewska 1987: 494, Svensson & al. 1990: 48, Schwarz & al. 1996: 33, Gusenleitner & Schwarz 2002: 175). The type material of *A. integra* conforms to the current interpretation of the species *A. chrysopyga* (as in Schmid-Egger & Scheuchl 1997, Gusenleitner & Schwarz 2002). The synonymy is here validated.

***Andrena intermedia* Thomson 1870b: 154.**

Lectotype ♀ ZML [**examined and type-labelled**]; SWEDEN, Norrland; Norl. [printed]/ small pinkish tag with partly torn irregular margin/ *intermedia* [hand, C.G. Thomson]; good,

except left antennal segments 3-12 and hindtarsal segments 2-5 on the left and 4-5 on the right side lost; *Andrena intermedia* Thomson, det. P. Niemelä 1949/ L.A. Nilsson 2008.

The taxon was described on the basis of both sexes but without information on locality. Almost certainly the latter was simply forgotten because Thomson soon (1872: 107) specified “found in Hälsingland”. That Thomson was able to make the restriction Hälsingland, which is a small province in “Norrland”, suggests that he had collected the material himself. Below the cabinet species label “*intermedia*” in Coll. Thomson (ZML) there are presently six specimens. This is remarkable because Niemelä (1949: 108) mentioned a total of nine specimens (“fünf Typexemplare” and “vier fremde Stücke”) in the collection. Three specimens have apparently been lost or misplaced since Niemelä’s study. Niemelä mentioned five type specimens, 2♀♀ and 3♂♂, and that the 2♀♀ and 2♂♂ bore the labelling “Norl.” (= Norrland). He wrote that he selected a ♀ as “lectoholotype” and a ♂ as “lectoallotype”. But evidently without labelling them so, because only due to his other information about the labelling (the ♀ bears Thomson’s handwritten label “*intermedia*”) and condition of the specimen (the ♂ has five and two antennal segments left on the left and the right side, respectively) his two selected specimens could here be located. Both bear Niemelä’s simple determination labels from the year 1949. Niemelä’s selected ♀ and ♂ specimens are here labelled as lectotype/lectoholotype and paralectotype/lectoallotype, respectively (both: “des. Niemelä 1949: 108, rec. L.A. Nilsson 2009”). Niemelä’s used old terms are indicated for historical reasons. Both specimens bear the printed label “Norl.”. Still, two specimens labelled “Norl.” and representing original material (syntypes) seem to be missing since Niemelä’s study. The lectoholotype and the lectoallotype conform to the current interpretation of the species *Andrena intermedia* Thomson (as in Schmid-Egger & Scheuchl 1997, Gusenleitner & Schwarz 2002). The species (Fig. 3) is rather common over inland Sweden, especially the middle and northern parts (SWBP).

Andrena Moravitz Thomson 1872: 78.

Lectotype ♀ ZML [here designated]; SWEDEN, Skåne län, Skåne; Scania [printed]/ *bicolor* Ny. *intermedia* Mor/ *Morawitz* [hand, C.G. Thomson]; excellent, almost complete (right midtarsal segments 4-5 lost), coat beautiful; *Andrena morawitz* Thomson, det. L.A. Nilsson 2008.

Thomson described the taxon from ♀ material (“Mas: mihi ignotus”) found in Skåne. Below the cabinet species label “*Morawitz*” in Coll. Thomson (ZML) there stand seven specimens, viz. 2♀♀ and 5♂♂. The 2♀♀ conform exactly to the description and qualify as syntypes. The left, first ♀ bears the original labelling as reported above, while the second bears only a label “*Morawitz*”. The first is here selected and labelled as lectotype and the second as paralectotype. Both bear K. Warncke’s determination label “*Andrena bimaculata* ssp. *morawitz* Thoms.”. The taxon has been controversial, viz. treated as a subspecies of *A. bimaculata* (Kirby, 1802) (by Alfken 1909: 41, 1912a: 47, Warncke 1967: 289, 1986: 45/47, Monsevičius 1995: 24), a mere synonym of *A. bimaculata* (by Dylewska 1987: 432, Svensson & al. 1990: 48, Schwarz & al. 1996: 32, Gusenleitner & Schwarz 2002: 130) or a distinct species (by Alfken 1913: 79, Stöckert 1930, Stöckert 1933: 114, Schmid-Egger & Scheuchl 1997, Nilsson 2003: 16, Söderman & Leinonen 2003: 82, Burger 2005: 29). However, *A. morawitz* (Fig. 4) is distinct in several characters and occurs syntopically with the first generation of *A. bimaculata* (Kirby) in Skåne and thus can neither be a subspecies nor conspecific (LAN pers. obs.). The typification provides authentic material. The species is very rare in Sweden and nationally red listed as EN, endangered (Gärdenfors 2005).

Andrena nasalis Thomson 1870b: 156.

Lectotype ♀ ZML [here designated]; SWEDEN; small black rhomboid tag/ Suecia. [printed]/ *nasalis* [hand, C.G. Thomson]; good, except left antennal segments 3-12 lost; *Andrena humilis* Imhoff, L.A. Nilsson 2007.

Thomson introduced the taxon as “*Andrena nasalis* (Kirby = *cinerascens* Nyl)” and then described the species from both sexes and including the geographical information “Tem-

ligen sällsynt i nordligare Sverige” (= Rather rare in northernly Sweden). This is remarkable from several aspects. Kirby (cf. 1802) never described a bee with the species epithet *nasalis* and there is no material labelled *nasalis* in Coll. Kirby (NHBM) (G. Else, pers. comm. 2005, D. Notton pers. comm. 2007). In Thomson’s next contribution (1872: 112), where the bee appeared under the name *Andrena fulvescens* Smith with “*Andrena nasalis* Thoms. Op. 156. 39.” listed as a synonym, a special remark was provided: “Denna art är sänd af Kirby till Gyllenhal under namn af *nasalis*” (= This species is sent by Kirby to Gyllenhal under name of *nasalis*). Thus, for his original description of *A. nasalis* Thomson had adopted what he thought was Kirby’s manuscript name. In Coll. Thomson (ZML) there is no cabinet species label “*nasalis*” but “*fulvescens*” below which there stand six specimens, 4♀♀ and 2♂♂. The first ♀ has a small black rhomboid tag, the label “Suecia” and the handwritten label “*nasalis*”. The remaining five bear no epithet label but one of them, a ♂ specimen, the label “Norl.” (= Norrland). The latter ♂ constitutes the only hint to why Thomson reported northernly Sweden as the origin for his material of *nasalis*. In addition, 1♂ and 1♀ bear the original labelling “Gyllenhal” (hand, probably A.G. Dahlbom). Clearly, the *nasalis*-labelled ♀, the ♂ from Norrland and Gyllenhal’s pair constitute authentic material of *nasalis* and are syntypes. Leonard Gyllenhaal (1752–1840) had his property at (Stora) Höberg in Västergötland, a province where he did much collecting. Indeed, in coll. Gyllenhaal (ZMU) the name “*Andrena nasalis* Eg. ♂.” occurs on the label of 1♂ (box 346 No 013) as well as on a cabinet species label in box 333 (both in Gyllenhaal’s hand-writing). Below the latter label there are no less than 24♂♂ and 24♀♀, all of which are completely devoid of any labelling that could indicate a locality (LAN pers. obs. 2005). Gyllenhaal added “Eg.” or “M.” after species names he had invented himself. All 48 specimens are *A. humilis* Illiger (det. L. Norén 2005). No doubt, they are from Västergötland because in Coll. Boheman (NHRS) there is 1♀ of *A. humilis* labelled “V.G.” (= Västergötland) and “*Ghl*” (= L. Gyllenhaal). The species has even been documented from Höberg itself, as



Figure 4. *Andrena morawitzi* Thomson ♀ (13 mm). This beautiful bee species was described from Skåne. Note her extensively dark-haired mesopleura, golden tibial scopa and orange hindtibia+tarsus. Photo: L.A. Nilsson.

Fältsandbi ♀. Thomson beskrev denna vackra biart från Skåne. Lägg märke till hennes utbrett mörkhåriga mellankroppssida, gyllene pollenborste och orange bakskenben+föt.

written on the original labelling of a specimen in coll. E. Munck af Rosenschöld (ZML, specimen "Reg beedata SE ArtDatabanken 20299"). With all probability, therefore, Gyllenhaal's 2♂♂ that Thomson both studied and added to his collection originated from Västergötland. The ♀ bearing Thomson's label "*nasalis*" is here selected as lectotype of *Andrena nasalis* Thomson and labelled so. It bears also the green label "Reg beedata SE ArtDatabanken 21661". The remaining three syntypes are here labelled as paralectotypes. The lectotype and the paralectotypes conform to the current common interpretation of the species *Andrena humilis* Imhoff,

1832 (as in e.g. Schmid-Egger & Scheuchl 1997, Gusenleitner & Schwarz 2002). According to all verified Swedish bee data, *Andrena humilis* has never been found in the northern part of the country thus indicating that the ♂ bearing the label "Norl." must have been mislabelled (probably by Thomson). That *A. nasalis* Thomson is a junior synonym of *A. humilis* Imhoff has been presumed for a century (e.g. as in Dalla Torre & Friese 1895: 45, Friese 1895: 202, Dalla Torre 1896: 132, Warncke 1967: 290, Dylewska 1987: 649, Svensson & al. 1990: 49, Schwarz & al. 1996: 41, Söderman & Leinonen 2002: 54). The synonymy is hereby validated.

***Andrena nigrospina* Thomson 1872: 80.**

Lectotype ♀ ZML [here designated]; SWEDEN, Skåne län, Bromölla kn, Gualöv, 56.03N/14.25E; Gual. 9/6 / *Flessae* [hand, C.G. Thomson]; abnormal from disease, viz. double-styloped, with grey-white, adpressed, subfertility pubescence on marginal zones of tergites 2-4 and with deformed segment bases on tergite 4 and 5, and, in addition, right antennal segments 4-12 lost; *Andrena nigrospina* Thomson, det. L.A. Nilsson 2003.

Thomson first (1870b: 144-5) divided his Swedish extensively black-haired *Andrena* of the *tibialis*-group into two taxa, viz. *A. pilipes* Fabricius and *A. flessae* Lepeletier. This seems to stem from the fact that the styloped specimen, first identified as *A. flessae*, exhibits abnormal characteristics reminding of *A. agillissima* (Scopoli, 1770) (of which *A. flessae* is a synonym, Schwarz & al. 1996: 29). Clearly, it was a misidentification (both of *A. agillissima* and *A. pilipes*, see below). In his next revision (1872), he kept *A. pilipes* but described his former *A. flessae* as a new taxon, viz. *A. nigrospina*. The description of the latter was exclusively based on the ♀ and he reported the original locality specifically as "funnen på Gualöfs sandfält i Skåne" (= found on the sand field of Gualöv in Skåne). Below the cabinet species label *nigrospina* in Coll. Thomson (ZML) there stand two specimens, left a ♀ and right a ♂ (LAN pers. obs. 2005). The ♀ conforms to the description (of the styloped specimen, although the condition of the specimen was not mentioned by Thomson) and indeed bears a label indicating



Figure 5. *Coelioxys obtusispina* Thomson ♂ and ♀ (13 respectively 14 mm). This parasitic bee species was described from the island of Gotland which is now the only known site in Europe where it still occurs. The host is *Megachile lagopoda* (Linné). Photo: L.A. Nilsson.

Thomsonkägelbi ♂ och ♀. Detta parasitiska bi beskrevs från Gotland som nu är enda kända platsen i Europa där arten finns kvar. Värden är stortapetsarabi *Megachile lagopoda*.

the locality Gualöv. It still bears also Thomson's handwritten label "Flessae". The ♂ specimen is from Östergötland. Baker (1994) studied the two specimens and simply informed that "...it has been possible to examine the holotype". Later, Baker (2000: 424) just listed "Holotype ♀ Museum of Zoology and Entomology, Lund University". However, Baker mentioned no designation or typification action. Indeed, the actual specimen was found to bear no type label (LAN pers. obs. 2008). Since Thomson did not explicitly indicate that he based the description on a single specimen, the ♀ is here designated as lectotype and labelled so. This specimen becomes name-bearing regardless of the fact that it is abnormal from disease and represents a misidentification by Thomson. Due to Baker's (2000) designation of a neotype of *Andrena pilipes* Fabricius, 1781 and the designation here of a lectotype of *A. nigrospina* Thomson, 1872, both taxa can be treated as distinct species. A two-species interpretation has gained support due to recent research and identification keys (viz. Baker 1994, 2000, Schmid-Egger & Scheuchl 1997, Schmid-Egger & Patiny 1997, Nilsson 2003). In parallel, a single-species interpretation (*pilipes*) has also been maintained (viz. Schwarz & al. 1996, Dylewska 2000, Gusenleitner & Schwarz 2002, Söderman & Vikberg 2002, Söderman & Leinonen 2003). In Sweden, only *A. nigrospi-*

na has been found. Material from the different provinces lacks the characteristics of *A. pilipes* revealed by Schmid-Egger & Patiny (1997); a comparative study here of their foreign material of *A. pilipes* corroborated this interpretation. The species *A. nigrospina* is nationally red listed as NT, near threatened (Gärdenfors 2005).

Andrena violascens Thomson 1870b: 151
Lectotype ♀ ZML [here designated]; SWEDEN, Norrland; Norl. [printed]/ *violascens* [hand, C.G. Thomson]; excellent, except left hindtarsus with segments 2-5 lost; *Andrena fulvida* Schenck, det. L.A. Nilsson 2008.

The taxon was described from both sexes found in the province of Hälsingland. Below the cabinet species label "*violascens*" in Coll. Thomson (ZML) there stand three specimens (1♀2♂♂). The ♀ and the first ♂ bear the original printed label "Norl." and qualify as syntypes. The ♀ bears Thomson's handwritten label "*violascens*" and is hereby selected as lectotype and labelled so. The ♂ is here labelled as paralectotype. Both specimens conform to the current interpretation of the species *Andrena fulvida* Schenck, 1853 (as in Schmid-Egger & Scheuchl 1997, Gusenleitner & Schwarz 2002). The taxon has been listed as a junior synonym of *Andrena bicolor* Fabricius, 1775 (Warncke 1967: 317, Dylewska 1987: 604, Svensson &

al. 1990: 48, Schwarz & al. 1996: 31, Guseleitner & Schwarz 2002: 123). It has also, then correctly, been listed as a junior synonym of *Andrena fulvida* Schenck (Forsius & Nordström 1923: 114, Forsius 1935: 13, Elfving 1968: 18, Nilsson 2003: 11). The typification validates the latter synonymy.

HALICTIDAE

Sphecodes crassus Thomson 1870a: 100.

Lectotype ♀ ZML [**here designated**]; SWEDEN, Norrland; Norl. [printed]/ pink rhomboid tag/ *crassus* [hand, C.G. Thomson]; excellent, complete; *Sphecodes crassus* Thomson, det. L.A. Nilsson 2008.

The taxon was described from ♀ material found in “norra Sverige” (= northern Sweden). Kjellander (1959: 16) wrote that “1♀ Norl. (Norrland) mit einem fleischroten rhomboidischen Zettel, ist wahrscheinlich das Typusexemplar” but mentioned no typification action. In Coll. Thomson there are 2♀♀ specimens labelled “Norl.” and “Nor.”, respectively. Only the first qualify as a syntype since the original description reads “abdomine segmentis 2-3 basi punctatissimis” (and the second ♀ is *S. ferruginatus* Hagens). The syntype specimen bears the red label “Typus”, possibly applied by Kjellander. The specimen is here designated as lectotype and labelled so. The lectotype conforms to the current interpretation of the common and wide-spread species *S. crassus* (as in e.g. Warncke 1992a, Amiet & al. 1999). The specimen is relatively large (body length 8.5 mm). The typification provides authentic material and a type locality.

Sphecodes pilifrons Thomson 1870a: 99.

Lectotype ♀ ZML [**examined**]; SWEDEN, Skåne län, Sjöbo kn, Ilstorp, 55.37N/13.40E; IISP 16/7 [hand, C.G. Thomson]; excellent, complete; *Sphecodes pellucidus* Smith, det. L.A. Nilsson 2008.

The taxon was described from both sexes and without any indication of locality. Kjellander (1959: 16) designated a lectotype. It bears the red label “*pilifrons* Thoms lectotypus E. Kjellander 1958”. He stated that *S. pilifrons* Thomson is a junior synonym of *S. pellucidus* Smith. This synonymy had been presumed for long

(viz. R.C.L. Perkins 1917: 46, 1922: 169, Blüthgen 1930: 726, 1934: 42, Stoeckert 1933: 103, Forsius 1935: 13, J.F. Perkins 1942: 195).

Sphecodes puncticeps Thomson 1870a: 99.

Lectotype ♀ ZML [**examined**]; SWEDEN, Skåne län, the northern part of Skåne; Scan bor. [printed]; excellent, complete; *Sphecodes puncticeps* Thomson, det. L.A. Nilsson 2008.

The taxon was described from both sexes without any indication of locality. Kjellander (1959: 16) designated a lectotype. It bears the red label “*puncticeps* Thoms lectotypus E. Kjellander 1958”. The species has a southern distribution in Sweden (reaches Uppland) and is nationally redlisted as NT, near threatened (Gärdenfors 2005).

Sphecodes reticulatus Thomson 1870a: 98.

Lectotype ♀ ZML [**examined**]; SWEDEN, Skåne län, Simrishamns kn, Äsperöd, 55.38N/14.12E; Esp [printed]/ *reticulatus* [hand, C.G. Thomson]; good, except left hindtarsal segments 2-5 lost; *Sphecodes reticulatus* Thomson, det. L.A. Nilsson 2008.

The taxon was described from both sexes without any indication of locality. Kjellander (1959: 15) designated a lectotype. It bears the red label “*reticulatus* Thoms lectotypus E. Kjellander 1958”. The species is redlisted as NT, near threatened, in Sweden (Gärdenfors 2005).

MEGACHILIDAE

Coelioxys obtusispina Thomson 1872: 277.

Lectotype ♀ ZML [**examined**]; SWEDEN, Gotlands län/kn, Gotland; G./ *obtusispina* [hand, C.G. Thomson]; excellent, except right antennal segments 8-12 and left 12 lost; *Coelioxys obtusispina* Thomson, det. S. Erlandsson.

The taxon was described from both sexes found on Gotland. Apparently, at least a ♀ bearing the label “G.” had been collected by Thomson himself. Below the cabinet species label “*obtusispina*” in Coll. Thomson (ZML) there are three specimens but only 1♀ and 1♂ bear a label indicating Gotland, viz. “G.” and “G1.”, respectively. Erlandsson (1955: 174/186) wrote that he designated the ♀ as “Lecto-Holotypus” and the ♂ as “Lecto-Allotypus”. The actual specimens bear the labels reading “Ty-

pus" and "Allotypus", respectively. They are here labelled as lectotype/lecto-holotypus and paralectotype/lecto-allotypus, respectively. Erlandsson's used old terms are indicated for historical reasons. In addition, Erlandsson (1955: 186) designated a ♂ in NHRS as "Paratypus" – an invalid taxonomical act. The latter specimen bears an identical original labelling as the "Lecto-Allotypus" and in addition "*obtusispina* m." (hand C.G. Thomson) but lacks any type-labelling (LAN pers. obs.). It bears a recent small green individual label "Reg beedata SE ArtDatabanken 13024" and is here labelled as "Paralectotype *Coelioxys obtusispina* Thomson 1872: 277 (= Paratypus des. S. Erlandsson 1955), rev. L.A. Nilsson 2009". Erlandsson's misused term is indicated for historical reasons. Despite Thomson's clear and decisive original description, the species was ignored for almost a century by the international scientific community. Forsius & Nordström (1921: 76) expressed the opinion that *C. obtusispina* merely represented specimens of *C. elongata* Lepeletier with somewhat abnormal tibial spurs. Forsius (1935: 15) accordingly listed it as a junior synonym. The taxon was also ignored in the monumental European standard work on Hymenoptera by Schmiedeknecht (1930). Erlandsson's 1955 paper, and perhaps especially Blüthgen's (1961: 37) comments on it, eventually removed the international doubts about the specific status of Thomson's taxon (as in Warncke 1992b). The species (Fig. 5) is nationally redlisted as EN, endangered (Gärdenfors 2005). In Europe, the species is only known from Sweden and now only the island of Gotland (Nilsson 2007b). The bee is in the top category for European species conservation in Sweden. According to Banaszak & Romasenko (1998), *C. obtusispina* also occurs in the Russian far East.

Megachile curvicrus Thomson 1872: 223-224. Lectotype ♀ ZML [here designated]; SWEDEN, Norrland; Norl. [printed]/ *curvicrus/curvicrus* [hand, C.G. Thomson]; excellent and beautiful, complete; *Megachile nigriventris curvicrus* Thomson, det. L.A. Nilsson 2008.

The taxon was described from both sexes, and the bee stated to occur in "northern and middle Sweden". Below the cabinet species label

"*curvicrus*" in Coll. Thomson there are seven specimens arranged in three rows (3+3+1). Five specimens (2♀♀3♂♂) qualify as syntypes. The first in the uppermost row bears Thomson's handwritten label "*curvicrus*" and is here selected as lectotype and labelled so. The remaining four specimens are here labelled as paralectotypes and bear the original labelling: "V.G." and "Schh." (= Västergötland, coll. C.J. Schönherr) (1♀), "Norl." (= Norrland) (1♂), "O.G." (= Östergötland) (1♂) and "umaensis 9 JI in silv." (= Umeå-area etc., coll. A.G. Dahlbom) (1♂). The lectotype and paralectotypes conform to the current interpretation of the species *Megachile nigriventris* Schenck, 1870 (as in e.g. Amiet & al. 2004, Scheuchl 2006). This synonymy has been listed for long (viz. Dalla Torre & Friese 1895: 74, Dalla Torre 1896: 442, Friese 1899: 114, 1911: 192, Schmiedeknecht 1907: 114, Forsius & Nordström 1921: 73, Stoeckert 1933: 217, Niemelä 1936: 91, Tkalců 1967: 99, Janzon & al. 1991: 95, Scheuchl 1996: 109, Schwarz & al. 1996: 109, Banaszak & Romasenko 1998: 151, Söderman & Leinonen 2003: 232). The typification provides authentic material. Tkalců (1977: 236) preferred to keep *curvicrus* as a name for a northern subspecies which ♀ differs by greyish-white pilosity on thorax laterally and the first two tergites (vs. brownish-yellow in the nominate subspecies). Subspecific status has been followed by Söderman & Vikberg (2002: 57) and doubtfully by Scheuchl (2006: 176). Swedish ♀ material of *M. nigriventris* has not been found to exhibit a brownish-yellow tinge and is thus distinct; subspecific status is justified (LAN pers. obs.).

Megachile Lapponica Thomson 1872: 227. Lectotype ♀ ZML [here designated]; SWEDEN, Västerbottens län, Lycksele kn, Lycksele, 64.35N/18.40E; Lycksele 2 Aug./ *Lapponica* [hand, C.G. Thomson]; complete, excellent; *Megachile lapponica* Thomson, det. L.A. Nilsson 2008.

The taxon was described from both sexes found "in Lapland". Below the cabinet species label "*lapponica*" in Coll. Thomson (ZML) there stand a total of seven specimens arranged in three rows. Five specimens (3♀♀2♂♂) qualify as syntypes. The first, left in the uppermost



Figure 6. A young *Megachile lapponica* Thomson ♀ (11 mm), who gymnastically exposes her pretty, vividly orange-coloured scopa (to attract a male?). This common boreal species was described from Swedish Lapland. The bee is oligolectic on fire weed *Epilobium angustifolium* and apparently adapted to fires of the boreal landscape – a fire insect. Photo: L.A. Nilsson.

Ung ♀ av rallarbi som gymnastiskt visar upp sin knallorange pollenborste (för att locka en hane?). Thomson beskrev denna vanliga, boreala biart från Lappland. Biet pollensamlar endast på rallarros och är uppenbarligen anpassad till skogslandskaps bränder - en brandinsekt.

row is a ♀ with the original labelling as reported above including Thomson's handwritten label "*Lapponica*". It is here selected as lectotype and labelled so. The remaining four (2♂♂, 2♀♀) are here labelled as paralectotypes. They bear the following original data: "*Lp. Interm.*" (= *Lapponia intermedia*) (1♂), "Lycksele 2 Aug." (1♂1♀), and "Stöttingfjäll 1 Aug." (1♀). The lectotype as well as the paralectotypes conform to the current interpretation of the species (as in Amiet & al. 2004, Scheuchl 2006). The species (Fig. 6) is one of the most common bees in the middle and northern Swedish woodlands, especially in clearings and burnt areas.

***Osmia claviventris* Thomson 1872: 254.**

Lectotype ♂ ZML [examined]; SWEDEN, Norrland; Norl. [printed]; right midleg and left hindleg beyond the femora lost. Right hindleg glued to the abdomen. Genitalia glued to a pinned piece of cartridge; *Hoplitis claviventris* (Thomson), det. L.A. Nilsson 2008.

Thomson described the taxon from both sexes and only provided the general geographical information "går ända upp till Norrland" (= occurs all the way up to Norrland). Below the cabinet species label "*claviventris*" in Coll. Thomson (ZML) there are 15 specimens. Tkalců (1974: 331) mentioned three syntypes (1♀2♂♂)

and designated a ♂ as lectotype. According to ZML's own attached labels, Tkalců had only those three on loan. He labelled one as "Lectotypus" and the other two as "Syntypus". In fact, there were a total of ten original syntypes (6♀♀4♂♂). The remaining 5♀♀ and 2♂♂ are here labelled as syntypes and are all *Hoplitis claviventris* (Thomson) (det. LAN 2008). The original labelling of the nine designated syntypes is: "Kristianstad" (♀), "Fsg 12/7" (= Fågelsång) (♀), "Scan" (= Skåne) (♀), "lervallar" and "Lund" (♂), "Sandby 23 9. 38" (♂), "Lund" (♂), "Ld" (= Lund) (♂♀) and "Vestml" (= Västmanland) (♀).

***Osmia truncatula* Thomson 1872: 239.**

Lectotype ♀ ZML [examined]; SWEDEN, Skåne län, Lunds kn, Lund, 55.43N/13.12E; ♀ [printed]/L. 7 [hand]/ *truncatula* Leiana K. [hand, C.G. Thomson]; good, except right forewing and left frontleg beyond femur tip lost; *Osmia leaiana truncatula* Thomson, det. L.A. Nilsson 2008.

Thomson described the taxon from both sexes "i södra Sverige" (= in southern Sweden). Below the cabinet species label "*truncatula*" in Coll. Thomson (ZML) there are 11 specimens (4♀♀7♂♂), 7 of which belong to the type series. Tkalců (1975: 311), who only had four

specimens on loan, designated a ♀ as lectotype and mentioned a further 1 ♀ and 2 ♂♂. The latter ♀ has been red labelled as “Syntypus ♀” by him. He changed the taxonomical status to subspecies, viz. *Osmia leaiana* (Kirby, 1802) *truncatula* Thomson, 1872 and mentioned that the 2 ♂♂ were identical to another species, viz. *Osmia fulvicornis* (Panzer). The identity of the 2 ♂♂ corroborated an earlier presumption (viz. by Blüthgen 1949: 85). The 2 ♂♂ are now interpreted as *Osmia niveata* (Fabricius, 1804) (det. L. Norén 2005, LAN pers. obs.). In addition to the four specimens studied by Tkalců another three authentic specimens were found. The latter three are here labelled as syntypes. The original labelling and the identity of all six syntypes are: “Scan” (= Skåne) (*O. leaiana* 2 ♀♀, *O. niveata* ♂), “Sero” (meaning unknown) and “Lund” (*O. niveata* ♂), “Ld” (= Lund, *O. niveata* ♂) and a pink rhomboid tag (= Lund area) (*O. leaiana* ♂) (all det. L. Norén 2005). That *O. truncatula* is a synonym of *O. leaiana* (Kirby, 1802) has been listed (viz. Tkalců 1975: 311, Vikberg 1986: 82, Banaszak & Romasenko 1998: 120, Söderman & Vikberg 2002: 57, Söderman & Leinonen 2003: 212). Tkalců (1975: 300/311) preferred to keep *truncatula* as a name for a northern subspecies which ♀ differs by its head, thorax and tergites 1-2 exhibiting completely white pilosity (vs. honey-yellow in the nominate subspecies). Scheuchl (2006: 181) accepted the subspecific status of the epithet *truncatula*. Swedish ♀ material of *O. leaiana* rarely exhibits a yellowish tinge and even in such cases it is distinctly less yellowish than in individuals from C Europe; subspecific status is justified (LAN pers. obs.).

APIDAE

NOMADINAE

Epeolus glacialis Alfken 1913: 36.

Lectotype ♀ ZML [here designated]; SWEDEN, Norrland; Norl. [printed]; good, except left antennal segments 8-12 lost; *Epeolus alpinus glacialis* Alfken, det. L.A. Nilsson 2008.

Alfken, indicating the work by Thomson (1872: 213), supplied *Epeolus glacialis* as a new name for *Epeolus variegatus* Thomson (nec Linné, 1758), a misidentified species. This was made possible due to F.D. Morice who on Alfken's behalf had examined “die Type der *Apis variegata*

L. im Britischen Museum”. Bischoff (1930: 8) designated a lectotype of *E. glacialis* from Rositten in former Germany (now Rybachiy in Russia), an act which is invalid; Coll. Thomson must supply type material (I.M. Kerzhner via M. Schwarz pers. comm. 2008). Of “*E. variegatus* (Lin.)”, Thomson first (1870a: 90) mentioned ♀ material from “northern Sweden”, but later (1872: 213) both sexes and more extensively from “Norrland and on Gotland; also in Dovre and in Ångermanland”. Below the cabinet species label “*variegatus*” in Coll. Thomson (ZML) there are six specimens, all of which qualify as syntypes (since Alfken did not indicate Thomson's 1870a but 1872 work). A single specimen bears a labelling “Norl.” (= Norrland) indicating northern Sweden. The specimen (♀) is here designated as lectotype of *Epeolus glacialis* Alfken and labelled so. The remaining five specimens are here labelled as paralectotypes. They bear the original labelling: a white paper quadrat, “♀” and “*variegatus*” (hand, C.G. Thomson), “G.” (= Gotland) (♂), “Dv.” and “Bhn.” (= Dovre, leg. C.H. Boheman) (2 ♀♀) and a purple paper quadrat, “Hrnö” and “Hernd” (= Härnösand in Ångermanland) (♀). The lectotype exhibits the following collectively decisive characters (vs. typical *E. alpinus* ♀ from Switzerland, viz. 1 ♀ Mattmark. Wallis. Suisse 9. VIII 1975 leg. H. Teunissen, ex coll. Warncke, 93): scutellum entirely blackish, humeri dark (brownish), mandible bases dark, anterior surface of midcoxae dark (brown), hindfemora almost exclusively (with exception of the tip and a posterodorsal streak) dark, some of the numerous semi-long erect hairs on mesonotum tinged brownish dark and lateral mesonotal hairs in front of the wing bases lean distinctly backwards. *Epeolus glacialis* Alfken has been treated as a distinct species (as by Alfken 1924: 34, Bischoff 1930: 8, Niemelä 1947: 39, Wolf 1960: 100, and alternatively Scheuchl 2000: 149), or as identical to and a junior synonym of *Epeolus alpinus* Friese, 1893 (as by Warncke 1986: 60, Janzon & al. 1991: 96, Monsevičius 1995: 114, Schwarz & al. 1996: 164, Scheuchl 2000: 149). The lectotype is here identified as a distinct northern subspecies of *Epeolus alpinus* Friese: *E. alpinus glacialis* Alfken **stat. nov.**

***Epeolus productus* Thomson 1870a: 91.**

Lectotype ♀ ZML [**examined and designation here validated**]; SWEDEN, Östergötlands län, Östergötland; *O.G./ Bhn.* [printed, C.H. Boheman]; good, except left antennal segments 4-12 lost; *Epeolus variegatus* (Linné), det. W. Celary 1997.

The taxon was described from both sexes found "in southern Sweden". Below the cabinet species label "*productus*" in Coll. Thomson (ZML) there stand 16 pins bearing a total of 22 specimens, 21 of which qualify as syntypes. W. Celary labelled a ♀ as lectotype and a ♂ as allotype in 1997 but does no longer plan to publish his results (pers. comm. 2006). His selected lectotype does agree with the original description and is hereby accepted and validated. The allotype bears the original label "Esp." (= Åsperöd). Since it was designated but lacks a name-bearing function, it is here labelled as paralectotype/paralectoallotype. The remaining 19 specimens (on 13 pins) are here labelled as syntypes. Their original labelling is "Båst." (= Båstad) (6♀♀), "*Sc. ar.*" and "*Bhn.*" (= eastern Skåne and leg. C.H. Boheman) (1♀), "*ar*" (= Arrie) (2♀♀), "*Scan lit.*" (= coast of Skåne) (3♀♀1♂), "*Tkv.*" (= Torekov) (1♂), "*Tkv 7/60*" (1♀), "*Ld*" (= Lund) (3♂♂) and a green rhomboid tag (= Ringsjön area) (1♀). The lectotype, allotype and paralectotypes of *E. productus* Thomson conform to the current interpretation of the species *Epeolus variegatus* (Linné, 1758) (as in Scheuchl 2000). The synonymy has been presumed for long (viz. Richards 1937: 90, 1978: 139, Niemelä 1947: 38, Elfving 1968: 49, Vikberg 1986: 83, Janzon & al. 1991: 96, Schwarz & al. 1996: 165, Scheuchl 2000: 150, Söderman & Vikberg 2002: 58, Söderman & Leinonen 2003: 272) and is hereby validated.

***Epeolus rufipes* Thomson 1870a: 91.**

Lectotype ♀ ZML [**examined and designation here validated**]; SWEDEN, Skåne län, Lunds kn, Abusa, 55.43N/13.25E; Abusa 12/8 27 [hand, A.G. Dahlbom]; excellent, complete; *Epeolus cruciger* Panzer, det. W. Celary 1997.

The taxon was described from ♀ material found "in southern Sweden". Below the cabinet species label "*rufipes*" in Coll. Thomson there are ten specimens (7♀♀3♂♂). Among these,

W. Celary has labelled a ♀ as lectotype and a ♂ as allotype in 1997 but does no longer plan to publish his results (pers. comm. 2006). Due to the original description and labelling a total of 5♀♀ specimens qualify as syntypes. Celary's selected ♀ specimen is among these and is hereby accepted as lectotype and validated. The remaining 4♀♀ specimens are here labelled as syntypes. Their original labelling is: a pink squarish tag (= Lund area) (2♀♀), "*Scan*" (= Skåne) (♀), and "*Lma 10/7 58*" (= Lomma) (♀), respectively. Celary's selected allotype ♂ bears the original labelling "*Sc. ar.*" and "*Bhn.*" (eastern Skåne and leg. C.H. Boheman); it does not belong to the type series and is invalid. After its description, *Epeolus rufipes* Thomson has been treated as a distinct species (by Thomson 1872: 212, Nordenström 1900: 207, Aurivillius 1903: 178) or, more commonly, as a junior synonym of *Epeolus cruciger* (Panzer, 1799) (as by Alfken 1904: 126, 1912a: 26, 1913: 34, Forsius & Nordenström 1921: 72, Jansson 1927: 151, Forsius 1935: 14, Richards 1937: 90, 1978: 139, Elfving 1968: 50, Vikberg 1986: 83, Janzon & al. 1991: 96, Schwarz & al. 1996: 165, Söderman & Vikberg 2002: 58, Söderman & Leinonen 2003: 275). The typification provides authentic material and a type locality. Future revisions will reveal whether or not one or more of the syntype labelled specimens are conspecific with, e.g., *Epeolus marginatus* Bischoff, 1930.

***Nomada bifida* Thomson 1872: 196.**

Lectotype ♀ ZML [**examined**]; SWEDEN, Bohuslän; *Bh./ Bhn.* [printed, C.H. Boheman]/*2-dentata* Ths [hand, C.G. Thomson]; good, except right antennal segments 6-12 and left 4-12 lost; *Nomada ruficornis* (Linné), det. L.A. Nilsson 2008.

The taxon was described from both sexes and with no special information on locality, just "Sällsynt i medlersta och södra Sverige" (= rare in middle and southern Sweden). Schwarz (1986: 479) designated a ♀ as lectotype, a ♂ as allolectotype and a ♀ as paralectotype. Schwarz reported the type locality as "Schweden: Skåne: Bohuslän", which is contradictory since this mentions two different provinces in Sweden. The pin of the lectotype bears the labels as reported above. The type locality is "Bh.", i.e. the

province of Bohuslän, in SW Sweden. "2-dentata Ths" is a manuscript name that found no further use by Thomson. That *Nomada bifida* Thomson is a junior synonym of *Nomada ruficornis* (Linné, 1758) was additionally established by lectotype fixation of the latter taxon by Day (1979: 71). The synonymy had already been listed for some time (viz. Perkins 1942: 196, Pittioni 1953: 268, Richards 1978: 139).

Nomada glabella Thomson 1870a: 96.

Lectotype ♀ ZML [examined]; SWEDEN, Skåne län, Ängelholms kn, Rössjöholm, 56.19N/13.06E; Rshm 16/6 [hand]/ *glabella* [hand, C.G. Thomson]; excellent, except right antennal segments 9-12 lost; *Nomada panzeri* Lepeletier, det. L.A. Nilsson 2008.

The taxon was described from both sexes and with no information on locality (except understood Sweden). Schwarz (1986: 474-475) designated a ♀ as lectotype, a ♂ as allolectotype and 3 ♀♀ 3 ♂♂ as paralectotypes. He stated that *Nomada glabella* Thomson is a junior synonym of *Nomada panzeri* Lepeletier, 1841, an interpretation that has gained wide acceptance (viz. Warncke 1986: 72, Janzon & al. 1991: 95, Celary 1995: 172, Schwarz & al. 1996: 160, Scheuchl 2000: 151, Söderman & Vikberg 2002: 58, Söderman & Leinonen 2003: 251). This interpretation is presently the most justified one since variation in *N. panzeri* s.lat. is considerable and deserves further study (cf. Stöckhert 1930: 1014/1049, Nilsson 2003: 49, Burger 2005: 34).

Nomada laeta Thomson 1870a: 93.

Lectotype ♀ ZML [examined]; SWEDEN, Skåne län, Båstads kn, Båstad, 56.26N/12.52E; small pink quadrate tag/ *laeta* [hand, C.G. Thomson]; excellent, complete; *Nomada baccata* Smith, det. L.A. Nilsson 2008.

The taxon was described from ♀ material but without mentioning of locality (except understood Sweden). In his next treatment, however, Thomson (1872: 188) specified the occurrence to the two localities Torekov and Båstad in NW Skåne. In his collection those from the first bear the label "Tkv." while the others bear a pink colour tag. The tag has been suggested to code for Båstad (R. Danielsson pers. comm. 2009). Schwarz (1986: 473) designated a ♀ as lecto-

type and 6 ♀♀ as paralectotypes. He stated that *Nomada laeta* Thomson is a junior synonym of *Nomada baccata* Smith, 1844, a synonymy that had been presumed by some writers (viz. Smith 1876: 120, Stöckhert 1933: 170, Pittioni 1953: 273).

Nomada punctiscuta Thomson 1870a: 96.

Lectotype ♀ ZML [examined]; SWEDEN, Skåne län, Svedala kn, Törringe, 55.31N/13.09E; Tör [hand]/ *punctiscuta* [hand, C.G. Thomson]; excellent, complete; *Nomada striata* Fabricius, det. L.A. Nilsson 2008.

The taxon was described from both sexes and with no information on locality (except understood Sweden). Schwarz (1986: 477) designated a ♀ as lectotype, a ♂ as allolectotype and 5 ♀♀ 2 ♂♂ as paralectotypes. He established that *N. punctiscuta* Thomson is a junior synonym of *Nomada striata* Fabricius, 1793.

Nomada 5-spinosa Thomson 1870a: 93.

Lectotype ♀ ZML [examined]; SWEDEN, Skåne län, Simrishamns kn, Äsperöd, 55.38N/14.12E; Esp./ *5-spinosa* [hand, C.G. Thomson]; excellent, complete; *Nomada alboguttata* Herrich-Schäffer, det. L.A. Nilsson 2008.

The taxon was described from both sexes but without mentioning of locality (except understood Sweden). Schwarz (1986: 472) designated a ♀ as lectotype, a ♂ as allolectotype and 3 ♀♀ 2 ♂♂ as paralectotypes. He stated that *Nomada quinquespinosa* Thomson is a junior synonym of *Nomada alboguttata* Herrich-Schäffer, 1839, a synonymy that had been presumed for long (viz. Dalla Torre & Friese 1894: 38, Dalla Torre 1896: 336, Alfken 1913: 106, Forsius & Nordström 1921: 74, Stöckhert 1930: 1000, Pittioni 1953: 273).

Nomada rufilabris Thomson 1870a: 95.

Lectotype ♀ ZML [examined]; SWEDEN, Skåne län, Lunds kn, Lund, 55.43N/13.12E; Lund [printed]/ *rufilabris* [hand, C.G. Thomson]; excellent, complete; *Nomada guttulata* Schenck, det. L.A. Nilsson 2008.

The taxon was described from ♀ material but without mentioning of locality (except understood Sweden). Schwarz (1986: 481) designated



Figure 7. *Nomada villosa* Thomson ♀ (11 mm). The type locality of this rather scarce but wide-spread parasitic bee is Skåne. The host is *Andrena lathyri* Alfken. Photo: L.A. Nilsson.

Vialgöcki ♀. Thomson beskrev detta ganska sparsamt men utbrett förekommande parasitiska bi från Skåne. Värddarten är vialsandbi.

a ♀ as lectotype and 2 ♀♀ as paralectotypes. He validated that *Nomada rufilabris* Thomson is a junior synonym of *Nomada guttulata* Schenck, 1859. This synonymy had been presumed (viz. Schenck 1874: 344, Saunders 1884: 175, Schmiedeknecht 1882-1884: 147, Dalla Torre & Friese 1894: 39, Friese 1895: 214, Dalla Torre 1896: 350).

Nomada villosa Thomson 1870a: 95.

Lectotype ♀ ZML [examined]; SWEDEN, Skåne län, Skåne; Scan [printed]/ *villosa* [hand, C.G. Thomson]; excellent, complete; *Nomada villosa* Thomson, det. M. Schwarz 1986.

The taxon was described from both sexes but without any mentioning of locality (except understood Sweden). Schwarz (1986: 478) designated a ♀ as lectotype, a ♂ as allolectotype and 6 ♀♀ as paralectotypes. The species (Fig. 7) is an exclusive cleptoparasite of *Andrena lathyri* Alfken and nationally redlisted as NT, near threatened (Gärdenfors 2005).

APINAE

Apathus lissonurus Thomson 1872: 49.

Lectotype ♀ ZML [examined]; SWEDEN, "Lappland"; Suecia [printed]/ *lissonurus* [hand on blue paper, C.G. Thomson]; good, except

wings worn and coat on tergites 4-6 lost, and also the left hindtarsal segments 4-5 and right hindtarsal segment 5 lost; *Bombus flavidus* Eversmann, det. L.A. Nilsson 2008.

The taxon was described from both sexes "found in Lapland". Ander (1967: 187) located type material and selected a lectotype. A further 3 specimens of the type series were here found. They bear the original labelling "'Suecica" [printed] (♂♀) and "Vilh. 20 Jul. in Silv." (= Vilhelmina) [hand, A.G. Dahlbom] (♂). They are here labelled as syntypes. Ander (1967: 187) mentioned that *Bombus lissonurus* Thomson was possibly a junior synonym of *Bombus flavidus* Eversmann, 1852. This synonymy had been presumed (viz. Popov 1931: 197, Pittioni 1942: 207) and has later been established (viz. Løken 1984: 28).

Bombus arenicola Thomson 1872: 31.

Lectotype ♀ ZML [examined]; SWEDEN, Skåne län, Skåne; Scania [printed]; excellent with perfect coat, complete; *Bombus veteranus* (Fabricius), det. L.A. Nilsson 2008.

The taxon was described from both sexes "in southernly Sweden". Ander (1967: 186) located type material and selected a lectotype. A further 16 specimens of the type series were here

found. They bear the original labelling: "Ilsp." (= Ilstorp) (4 workers), "ar" (= Arrie) (1 worker, 1♂), "Scan" (= Skåne) (2♂♂), "Scania" (♀), "Båst. 7/63" (= Båstad) (♀), "Sk" (1 worker), "Lund" (1♀, 1 worker), "Ld" (= Lund) (♀), "Ld" (= Lund) (1 worker), and "L.8" (= Lund) (♀). They are here labelled as syntypes. Ander (1967: 186) stated that *Bombus arenicola* Thomson is a junior synonym of *Bombus veteranus* (Fabricius, 1793), a synonymy that had been presumed (viz. Schenck 1875: 328, Løken 1966: 201).

***Bombus brevigena* Thomson 1870c: 255.**

Lectotype ♀ ZML [examined]; SWEDEN, Norrbottens län, Jokkmokks kn, Kvikkjokk, 66.54N/17.40E; quickjock [hand, P.F. Wahlberg]/ *brevigena* [hand, C.G. Thomson]; good, coat beautiful but right antennal segments 4-12 lost; *Bombus wurflenii brevigena* Thomson, det. L.A. Nilsson 2008.

The taxon was described from both sexes found "in Lapland". In the last sentence of the description Thomson wrote "perhaps *B. mastrucatus* Gerst.". Ander (1967: 186) located type material and designated a lectotype. A further 9 specimens of the type series were here found. They bear the original labelling: "quickjock" (2♀♀, 1♂, 2 workers), "Lap." (= Lapland) (1♀, 2 workers) and "Åre" (1 worker). They are here labelled as syntypes. Ander (1963: 194) had already mentioned that *B. brevigena* Thomson is a junior synonym of *B. mastrucatus* Gerstaecker, 1869. Later, *B. brevigena* has been listed as a doubtful (junior) synonym of *B. wurflenii* Radoszkowski, 1859 ssp. *mastrucatus* Gerstaecker (Vikberg 1986: 84) or as a synonym of that subspecies (Janzon & al. 1991: 96), or simply as a synonym of *B. wurflenii* (Løken 1973: 25, Schwarz & al. 1996: 189). According to Reinig & Rasmont (1988: 37) and P. Rasmont (pers. comm. 2003), the epithet *brevigena* should be used for the subspecies of *B. wurflenii* that inhabits Scandinavia.

Acknowledgements

I wholeheartedly thank Roy Danielsson, Curator at ZML, who helped in every possible way during the work in Coll. Thomson. Lars Norén (Gnesta) located some of the taxonomically decisive material. Mats Eriksson, Hans Mejlon (ZMU) and Bert Viklund (NHRS) made additional material of bees available for

study and George R. Else and David Notton (NHBM) checked for *Andrena nasalis* in Coll. Kirby. Foreign comparative material of *Epeolus* was provided by Maximilian Schwarz (Ansfelden, Austria), *Andrena nigrospina* and *A. pilipes* by Christian Schmid-Egger (Herrsching, Germany), and *Megachile nigriventris* and *Osmia leaiana* by Andreas Müller (Zürich, Switzerland). It is a privilege also to thank Mikael Sörensson (Lund), Maximilian Schwarz, Charles D. Michener (Lawrence, USA), Izya M. Kerzhner (St. Petersburg, Russia), Pierre Rasmont (Mons, Belgium), Waldemar Celary (Kraków, Poland) och Mats Thulin (Uppsala) for taxonomical advice, other information and/or comments on the manuscript. Uppsala University and the Swedish Species Information Centre (ArtDatabanken, Uppsala) provided financial support.

References

- Alfken, J.D. 1904. Über einige Bienen-Arten Thomson's. – Abh. Naturw. Ver. Bremen 18: 125-128.
- Alfken, J.D. 1909. Zur Kenntnis einiger paläarktischer Bienen und Beschreibung zweier neuer Arten. – D. Ent. Zeitschr. 53: 41-47.
- Alfken, J.D. 1912a. Die Bienenfauna von Westpreussen. – Ber. Westpr. Bot.-Zool. Ver. Danzig 34: 1-96.
- Alfken, J.D. 1912b. Die Bienenfauna von Ostpreussen. – Schr. Phys.-ökon. Ges. Königsberg 53: 114-182.
- Alfken, J.D. 1913. Die Bienenfauna von Bremen. – Abh. Naturw. Ver. Bremen 22: 1-220.
- Alfken, J.D. 1924. Beitrag zur Kenntnis einiger Bienen Finnlands. – Not. Ent. 4: 33-40.
- Amiet, F., Herrmann, M., Müller, A. & Neumeyer, R. 2004. Apidae 4. – Fauna Helvetica 9: 1-273.
- Amiet, F., Müller, A. & Neumeyer, R. 1999. Apidae 2. – Fauna Helvetica 4: 1-219.
- Ander, K. 1963. Om humlor och snylthumlor. Notiser om gaddsteklar (Hym.) 3. – Opusc. Ent. 28: 189-195.
- Ander, K. 1967. Designation of lectotypes in *Bombus* and *Psithyrus* described by Swedish authors. – Opusc. Ent. 32: 184-187.
- Aurivillius, C. 1903. Steklar. Hymenoptera. 1. Gaddsteklar. Aculeata. Första Familjen. Bin. Apidae. – Ent. Tidskr. 24: 129-218.
- Baker, D.B. 1994. On the nomenclature of two sibling species of the *Andrena tibialis* (Kirby, 1802) group (Hymenoptera, Apoidea). – Ent. Gaz. 45: 281-290.
- Baker, D.B. 2000. *Andrena pilipes* Fabricius, 1781: designation of neotype (Insecta: Hymenoptera: Apoidea: Andrenidae). – Reichenbachia 33: 421-425.
- Banaszak, J. & Romasenko, L. 1998. Megachilid bees of Europe (Hymenoptera, Apoidea, Megachilidae). – Pedagogical University of Bydgoszcz, Bydgoszcz.
- Bengtsson, S. 1900. C. G. Thomson. Minnesteckning. – Ent. Tidskr. 21: 1-16.
- Bischoff, H. 1930. Beitrag zur Kenntnis paläarktischer Arten der Gattung *Epeolus*. (Hym. Apid.). – D. Ent. Zeitschr. 1930: 1-15.
- Blüthgen, P. 1930. *Sphecodes*, *Prosopis* and *Colletes*. – In: Schmiedeknecht O. Die Hymenopteren Nord- und Mitteleuropas. Ed. 2. Fischer, Jena.

- Blüthgen, P. 1934. Die Wirte der paläarktischen *Sphecodes*-Arten (Hym. Apidae. Halictinae.). – Z. Wiss. Insektenbiol. 27: 33-42.
- Blüthgen, P. 1949. Neues oder Wissenwertes über mittel-europäische Aculeaten und Goldwespen. – Beitr. Tax. Zool. 1: 77-100.
- Blüthgen, P. 1961. Neues und Wissenwertes über mitteleuropäische Aculeaten und Goldwespen IV. – Nachrichtenbl. Bayer. Ent. 10: 35-39.
- Burger, F. 2001. Kommentierte Checkliste der Wildbienen Thüringens (Hymenoptera, Apidae). – Check-Listen Thüringer Insekten und Spinnentiere 9: 17-57.
- Burger, F. 2005. Rote Liste Wildbienen. – Sächsisches Landesamt für Umwelt und Geologie.
- Celary, W. 1995. Nomadini (Hymenoptera, Apoidea, Anthophoridae) of Poland. – Monogr. Fauny Polski 20: 1-281.
- Dalla Torre, K.W. v. 1896. Catalogus Hymenopterorum hucusque descriptorum systematicus et synonymicus. Vol. X. Apidae (Anthophila). – Engelmann, Lipsiae.
- Dalla Torre, K.W. v. & Friese, H. 1894. Synonymischer Katalog der europäischen Schmarotzerbienen. – Ent. Nachr., Berlin 20: 33-43.
- Dalla Torre, K.W. v. & Friese, H. 1895. Synonymischer Katalog der europäischen Sammelbienen. – Ent. Nachr., Berlin 21: 21-26, 37-50, 53-62, 69-80.
- Dathe, H. 1980. Die Arten der Gattung *Hylaeus* F. in Europa (Hymenoptera: Apoidea, Colletidae). – Mitt. Zool. Mus. Berlin 56: 207-294.
- Day, M.C. 1979. The species of Hymenoptera described by Linnaeus in the genera *Spheg*, *Chrysis*, *Vespa*, *Apis* and *Mutilla*. – Biol. J. Linn. Soc. 12: 45-84.
- Dylewska, M. 1987. Die Gattung *Andrena* Fabricius (Andrenidae, Apoidea) in Nord- und Mitteleuropa. – Acta Zool. Cracov. 30: 359-708.
- Dylewska, M. 2000. Klucze do oznaczenia owadów Polski. Hymenoptera, Apidae, Andreninae. – Polskie Towarz. Ent. 24 (68d): 1-152.
- Elfving, R. 1951. Die Gattung *Prosopis* Fabr. (Hym., Apidae) in Finnland. – Not. Ent. 31: 67-92
- Elfving, R. 1968. Die Bienen Finnlands. – Fauna Fennica 21: 1-69.
- Erlandsson, S. 1955. Die schwedischen Arten der Gattung *Coelioxys* Latr. (Hym. Apidae). – Opusc. Ent. 20: 174-191.
- Erlandsson, S., Janzon, L.-Å. & Svensson, B.G. 1988. Catalogus Insectorum Sueciae. Hymenoptera, Apoidea. 1. Colletidae and Melittidae. – Ent. Tidskr. 109: 161-163.
- Fitton, M.G. 1982. A catalogue and reclassification of the Ichnumonidae (Hymenoptera) described by C. G. Thomson. – Bull. Br. Mus. Nat. Hist. (Ent.) 45(1): 1-119.
- Forsius, R. 1935. Apidae. – In: Forsius R. & Hellén W. Enumeratio Insectorum Fenniae II. Hymenoptera 1. Symphyta et Aculeata. Pp. 12-15. Helsingfors Entomologiska Bytesförening.
- Forsius, R. & Nordström, Å. 1921. Verzeichnis der aus Finnland bisher bekannten Apiden. – Not. Ent. 1: 71-77.
- Forsius, R. & Nordström, Å. 1923. Weitere Beiträge zur Kenntnis der Apiden Finnlands. – Not. Ent. 3: 112-115.
- Friese, H. 1895. Beitrag zur Bienenfauna von Baden und dem Elsass. – Ber. Naturf. Ges. Freiburg im Breisgau 9: 194-220.
- Friese, H. 1899. Die Bienen Europa's (Apidae europaeae). V. Genera *Lithurgus*, *Megachile*. – Lampe, Innsbruck.
- Friese, H. 1911. Das Tierreich. 28. Apidae I. Megachilinae. – Friedländer, Berlin.
- Gårdenfors, U. (ed.) 2005. The 2005 red list of Swedish species. – ArtDatabanken, SLU, Uppsala.
- Gusenleitner, F. & Schwarz, M. 2002. Weltweite Checkliste der Bienengattung *Andrena* mit Bemerkungen und Ergänzungen zu paläarktischen Arten (Hymenoptera, Apidae, Andreninae, *Andrena*). – Entomofauna Suppl. 12: 1-1280.
- ICZN. 1999. International code of zoological nomenclature. Ed. 4. – The International Trust for Zoological Nomenclature, London.
- Jansson, A. 1925. Die Insekten-, Myriopoden- und Isopodenfauna der Gotska Sandön. – Lindhska, Örebro.
- Jansson, A. 1927. För Sverige nya biarter jämte synonymiska anmärkningar rörande andra förut som svenska kända arter. – Ent. Tidskr. 48: 150-153.
- Janzon, L.-Å. & Svensson, B.G. 1984. Aculeate Hymenoptera from a sandy area on the island of Öland, Sweden. – Nova Acta Reg. Soc. Sci. Ups., Ser. V:C 3: 181-188.
- Janzon, L.-Å., Svensson, B.G. & Erlandsson, S. 1991. Catalogus Insectorum Sueciae. Hymenoptera, Apoidea. 3. Megachilidae, Anthophoridae and Apidae. – Ent. Tidskr. 112: 93-99.
- Kirby, W. 1802. Monographia Apum Angliae. II. – Ipswich.
- Kjellander, E. 1959. Revision der in coll. C. G. Thomson in Lund befindlichen *Sphecodes*-Arten (Hym. Apidae). – Opusc. Ent. 24: 15-17.
- Koster, A. 1986. Het genus *Hylaeus* in Nederland (Hymenoptera, Colletidae). – Zool. Bijdr. 36: 1-120.
- Løken, A. 1966. Notes on Fabrician species of *Bombus* Latr. and *Psithyrus* Lep., with designations of lectotypes (Hym., Apidae). – Ent. Medd. 34: 199-206.
- Løken, A. 1973. Studies on Scandinavian bumble bees (Hymenoptera, Apidae). – Nor. Ent. Tidsskr. 20: 1-218.
- Løken, A. 1984. Scandinavian species of the genus *Psithyrus* Lepeletier (Hymenoptera: Apidae). – Ent. Scand. Suppl. 23: 1-45.
- Méhely, L. 1935. Naturgeschichte der Urbienen. – Stephaneum Nyomda és Könyrikiadó R.T., Budapest.
- Michener, C.D. 2007. The bees of the world. 2nd ed. – Hopkins, Baltimore.
- Monsevičius, V. 1995. A check-list of the bee species (Hymenoptera, Apoidea) of Lithuania with data to their distribution and bionomics. – In: New and rare for Lithuania insect species. Records and descriptions of 1994-1995. Pp. 7-145. Institute of Ecology, Lithuanian Entomological Society, Vilnius.
- Niemelä, P. 1936. Mitteilungen über die Apiden (Hym.) Finnlands. 1. Die Gattung *Megachile* Latr. – Ann. Ent. Fenn. 2: 86-96.
- Niemelä, P. 1947. Mitteilungen über die Apiden (Hym.) Finnlands. 2. Die Gattung *Epeolus* Latr. – Ann. Ent. Fenn. 13: 35-43.
- Niemelä, P. 1949. Mitteilungen über die Apiden Finnlands. 3. Die Untergattung *Taeniandrena* Hedicke. – Ann. Ent. Fenn. 15: 101-120.
- Nilsson, L.A. 2003. Prerevisional checklist of the bees of Sweden (Hymenoptera: Apoidea). – ArtDatabanken, Uppsala.
- Nilsson, L.A. 2005. Blålocksandbi – en bevarandebiologisk utvärdering. – Länsstyrelsen i Gotlands Län, Rapport om natur och miljö 2005: 2.
- Nilsson, L.A. 2007a. The type material of Swedish bees (Hymenoptera, Apoidea) I. – Ent. Tidskr. 128: 167-181.

- Nilsson, L.A. 2007b. Stora bin på stora blomster. En bevarandeinventering av stortapetserarbi *Megachile lagopoda*, och dess parasitiska kägelbin storkägelbi, *Coelioxys conoidea*, och thomsonkägeln, *Coelioxys obtusispina*, i Sverige 2006. – Länsstyrelsen Södermanlands län Rapport Nr 2007:9.
- Nilsson, L.A. 2008. The type material of Swedish bees (Hymenoptera, Apoidea) II. *Andrena haemorrhoidalis* Fabricius 1775 and *Bombus balteatus* Dahlbom 1832. – Entomofauna 29: 1-5.
- Nilsson, L.A. 2009. The type material of Swedish bees (Hymenoptera, Apoidea) III. – Ent. Tidskr. 130: 43-59.
- Nilsson, L.A. & Cederberg, B. 2008. Svenska namn på vildbin. – <http://www.artdata.slu.se/svenskaartprojektet>.
- Nordenström, H. 1900. Några bidrag till kännedomen om svenska hymenopterers geografiska utbredning. – Ent. Tidskr. 21: 201-208.
- Noskiewicz, J. 1936. Die palearktischen *Colletes*-Arten. – Pr. Nauk. Wyd. Tow. Nauk. Lwow. 2 (3): 1-532.
- Perkins, J.F. 1942. Hymenoptera Aculeata captured in southern Skåne, Sweden, in 1938. – Ann. Mag. Nat. Hist. (11) 9: 192-202.
- Perkins, R.C.L. 1917. On the Kirby collection of *Sphecodes*, *Nomada*, *Andrena*, and *Cilissa*, with the description of a species of *Sphecodes* hitherto unrecorded from Britain. – Ent. Mon. Mag. 53: 45-52.
- Perkins, R.C.L. 1922. The British species of *Halictus* and *Sphecodes*. – Ent. Mon. Mag. 58: 167-174.
- Pittioni, B. 1942. Die borealpinen Hummeln und Schmarotzerhummeln (Hymen., Apidae, Bombinae), I. – Mitt. K. Naturw. Inst. Sofia-Bulg. 15: 155-218.
- Pittioni, B. 1953. Die *Nomada*-Arten der Alten Welt. Bestimmungstabelle der Männchen. – Ann. Naturhist. Mus. Wien 59: 223-291.
- Popov, V.V. 1931. Zur Kenntnis der paläarktischen Schmarotzerhummeln (*Psithyrus* Lep.). – Eos, Madrid 7: 131-209.
- Reinig, W.F. & Rasmont, P. 1988. Contribution to the knowledge of *Alpinobombus wurfleini* (Radoszkowski, 1859) (Hymenoptera, Apidae, Bombinae). – Spixiana 11: 37-67.
- Richards, O.W. 1937. A study of the British species of *Epeolus* Latr. and their races, with a key to the species of *Colletes* (Hymen., Apidae). – Trans. Soc. Br. Ent. 4: 89-130.
- Richards, O.W. 1978. Aculeata. – In: Kloet, G. S. & Hincks, W. D. A check list of British insects. Part 4: Hymenoptera. Pp. 126-140. Handbooks for the Identification of British Insects 11 (4): 1-159.
- Saunders, E. 1884. XII. Synopsis of British Hymenoptera. Anthophila; part II., Apidae. – Trans. Ent. Soc. London 1884: 159-250.
- Schenck, A. 1874. Aus der Bienen-Fauna Nassau's II. – Berl. Ent. Zeitschr. 18: 337-347.
- Schenck, A. 1875. Aus der Bienen-Fauna Nassau's. – D. Ent. Zeitschr. 19: 321-332.
- Scheuchl, E. 1996. Illustrierte Bestimmungstabellen der Wildbienen Deutschlands und Österreichs. II: Megachilidae – Melittidae. – Erwin Scheuchl, Velden.
- Scheuchl, E. 2000. Illustrierte Bestimmungstabellen der Wildbienen Deutschlands und Österreichs. I: Anthophoridae. Ed. 2. – Preisinger, Landshut.
- Scheuchl, E. 2006. Illustrierte Bestimmungstabellen der Wildbienen Deutschlands und Österreichs. II: Megachilidae – Melittidae. Ed. 2. – Erwin Scheuchl & Apollo Books, Stenstrup.
- Schmid-Egger, C. & Patiny, S. 1997. Anmerkungen zur *Andrena-pilipes*-Gruppe (= *carbonaria* auct.). – Bem-bix 8: 37-42.
- Schmid-Egger, C. & Scheuchl, E. 1997. Illustrierte Bestimmungstabellen der Wildbienen Deutschlands und Österreichs unter Berücksichtigung der Arten der Schweiz III: Andrenidae. – Erwin Scheuchl, Velden.
- Schmiedeknecht, O. 1882-1884. Apidae Europaeae (Die Bienen Europas). I. – Friedländer, Gumperda & Berlin.
- Schmiedeknecht, O. 1907. Die Hymenopteren Mitteleuropas. Ed. 1. – Fischer, Jena.
- Schmiedeknecht, O. 1930. Die Hymenopteren Nord- und Mitteleuropas. Ed. 2. – Fischer, Jena.
- Schwarz, M. 1986. Revision der *Nomada*-Arten der Sammlung C. G. Thomson (Hymenoptera, Apoidea). – Entomofauna 7: 469-484.
- Schwarz, M., Gusenleitner, F., Westrich, P. & Dathe, H.H. 1996. Katalog der Bienen Österreichs, Deutschlands und der Schweiz (Hymenoptera, Apidae). – Entomofauna Suppl. 8: 1-398.
- Smitten, J. v.d. 2001. Zur Unterscheidung der ♀♀ von *Andrena albofasciata* Thomson 1870 und *A. ovatula* (Kirby 1802). – Bombus 3: 209-213.
- Smith, F. 1876. Catalogue of British Hymenoptera in the collection of the British Museum. Ed. 2. Part I. – Andrenidae and Apidae. – The Trustees, London.
- Stoekert, F.K. 1933. Die Bienen Frankens (Hym. Apid.). Eine ökologisch-tiergeographische Untersuchung. – Beih. D. Ent. Zeitschr. 1932: 1-294.
- Stöckert, E. 1930. *Andrena* and *Nomada*. – In: Schmiedeknecht O. 1930. Die Hymenopteren Nord- und Mitteleuropas. Ed. 2. Fischer, Jena.
- Svensson, B.G., Erlandsson, S. & Janzon, L.-Å. 1990. Catalogus Insectorum Sueciae. Hymenoptera, Apoidea. 2. Andrenidae and Halictidae. – Ent. Tidskr. 111: 47-52.
- Söderman, G. & Leinonen, R. 2003. Suomen mesipistiäiset ja niiden uhanalaisuus. – Tremex Press Oy, Helsinki.
- Söderman, G. & Vikberg, V. 2002. Suomen myrkkypistiäisten luettelo ja levinneisyys (Hymenoptera, Apocrita, Aculeata). – Sahlbergia 7: 41-66.
- Thomson, C.G. 1869a. I. Försök till gruppering af Sveriges Apiarier. – In: Thomson, C.G. (ed.). Opuscula Entomologica, Part 1. Pp. 1-25. Lundbergska, Lund.
- Thomson, C.G. 1869b. III. Genus *Coelioxys*. Conspectus specierum Sueciae. – In: Thomson, C.G. (ed.). Opuscula Entomologica, Part 1. Pp. 41-43. Lundbergska, Lund.
- Thomson, C.G. 1870a. VI. Öfversigt af de i Sverige funna arter af *Epeolus*, *Nomada* och *Sphecodes*. – In: Thomson, C.G. (ed.). Opuscula Entomologica, Part 2. Pp. 90-100. Ohlsson, Lund.
- Thomson, C.G. 1870b. X. Öfversigt af de i Sverige funna arter af Genus *Andrena*. – In: Thomson, C.G. (ed.). Opuscula Entomologica, Part 2. Pp. 140-156. Ohlsson, Lund.
- Thomson, C.G. 1870c. XIV. Öfversigt af Sveriges humlor. – In: Thomson, C.G. (ed.). Opuscula Entomologica, Part 2. Pp. 251-261. Ohlsson, Lund.
- Thomson, C.G. 1870d. XVI. Öfversigt af de i Sverige funna arter af *Hyalaes*, *Halictus*, *Colletes* och *Rhopites*. – In: Thomson, C.G. (ed.). Opuscula Entomologica, Part 2. Pp. 305-316. Ohlsson, Lund.
- Thomson, C.G. 1872. Hymenoptera Scandinaviae. II. (Apis Lin.). – Berling, Lundae.

- Thomson, C.G. 1888. XXXVII. Bidrag till Sveriges insect-fauna. – Opusc. Ent. 12: 1202-1265.
- Tjeder, B. 1954. Östskånska insekter I. Trichoptera och Hymenoptera (partim). – Opusc. Ent. 14: 58-69.
- Tkalcü, B. 1967. Bemerkungen zur Taxonomie einiger paläarktischer Arten der Familie Megachilidae (Hymenoptera, Apoidea). – Acta Ent. Bohemosl. 64: 91-104.
- Tkalcü, B. 1974. Ergebnisse der Albanien Expedition 1961 des "Deutschen Entomologischen Institutes, 89. Beitrag, Hym. Apoidea 5. – Beitr. Ent. 24: 323-348.
- Tkalcü, B. 1975. Revision der europäischen *Osmia* (*Chalcosmia*)-Arten der *fulviventris*-Gruppe (Hymenoptera: Apoidea: Megachilidae). – Vest. Ceskoslov. Spol. Zool. 39: 297-317.
- Tkalcü, B. 1977. Taxonomisches zu einigen paläarktischen Bienenarten (Hymenoptera: Apoidea). – Vest. Ceskoslov. Spol. Zool. 41: 223-239.
- Vikberg, V. 1986. A checklist of aculeate Hymenoptera of Finland (Hymenoptera, Apocrita Aculeata). – Not. Ent. 66: 75-85.
- Warncke, K. 1967. Beitrag zur Klärung paläarktischer *Andrena*-Arten (Hym. Apidae). – Eos 43: 171-318.
- Warncke, K. 1972. Beitrag zur Systematik und Verbreitung der Bienengattung *Prosopis* F. in der Westpaläarktis (Hymenoptera, Apoidea, Colletidae). – Bull. Rech. Agronom. Gembloux 5: 745-768. (1970)
- Warncke, K. 1978. Über die westpaläarktischen Arten der Bienengattung *Colletes* Latr. (Hymenoptera, Apoidea). – Polskie Pismo Ent. 48: 329-370.
- Warncke, K. 1986. Die Wildbienen Mitteleuropas, ihre gültigen Namen und ihre Verbreitung (Insecta: Hymenoptera). – Entomofauna Suppl. 3: 5-128.
- Warncke, K. 1992a. Die westpaläarktischen Arten der Bienengattung *Sphecodes* Latr. – Ber. Naturf. Ges. Augsburg 52: 9-64.
- Warncke, K. 1992b. Die westpaläarktischen Arten der Bienengattung *Coelioxys* Latr. (Hymenoptera, Apidae, Megachilinae). – Ber. Naturf. Ges. Augsburg 53: 31-77.
- Wolf, H. 1960. Akuleate Hautflügler (Hym. Pompiloidea, Sphecoidea, Apoidea) aus dem Zoologischen Institut der Universität Lund. – Opusc. Ent. 25: 98-100.

Sammanfattning

Uppsatsen presenterar fjärde delen av resultatet av en taxonomisk granskning och revision av typmaterialet av bin av svenskt känt eller möjligt ursprung. Granskningens fokus har, som i del I (ET 128: 167-181, 2007), lagts på taxonomisk status, depositionsinstitution, typlokal, etikettering, fysiska tillstånd ("kvalitet") och identitet. Föreliggande del behandlar bin som beskrivits av Sveriges genom tiderna skickligaste och mest skarpögde entomolog, lundensaren Carl Gustaf Thomson (1824 – 1899). Inledningsvis presenteras kortfattat denne förgrundsgestalt inom den europeiska biodiversitetsforskningen.

I uppsatsen utses lektotyper för artrangstaxa (fet stil = giltigt epitet): *Colletes picistigma* Thomson, 1872, *Hylaeus clathratus* Thomson, 1870, *H. genalis* Thomson, 1872, *H. marginatus* Thomson, 1870, *Andrena curvungula* Thomson, 1870, *A. integra* Thomson, 1870, *A. morawitzi* Thomson, 1872, *A. nasalis* Thomson, 1870, *A. nigrospina* Thomson, 1872, *A. violascens* Thomson, 1870, *Sphecodes crassus* Thomson, 1870, *Megachile curvicrus* Thomson, 1872 (nu subspecies av *M. nigriventris* Schenck), *M. lapponica* Thomson, 1872 och *Epeolus glacialis* Alfken, 1913 (nu subspecies av *E. alpi-*

nus Friese). Lektotyper valideras för *Hylaeus submarginatus* Thomson, 1872, *Andrena albofasciata* Thomson, 1870, *Epeolus rufipes* Thomson, 1870 och *E. productus* Thomson, 1870. Ytterligare taxa som granskas och för vilka i relevanta fall syntyper utses är *Andrena intermedia* Thomson, 1870, *Sphecodes pilifrons* Thomson, 1870, *S. puncticeps* Thomson, 1870, *S. reticulatus* Thomson, 1870, *Coelioxys obtusispina* Thomson, 1872, *Osmia claviventris* Thomson, 1872 (nu *Hoplitis c.*), *O. truncatula* Thomson, 1872 (nu subspecies av *O. leaiana* (Kirby)), *Nomada bifida* Thomson, 1872, *N. glabella* Thomson, 1870, *N. laeta* Thomson, 1870, *N. punctiscuta* Thomson, 1870, *N. 5-spinosa* Thomson, 1870, *N. rufilabris* Thomson, 1870, *N. villosa* Thomson, 1870, *Apathus lissonurus* Thomson, 1872, *Bombus arenicola* Thomson, 1872 och *B. brevigena* Thomson, 1870 (nu subspecies av *B. wurflenii* Radoszkowski).

Typifieringarna definierar autentiskt material och typlokaler samt etablerar korrekta synonymier. *Andrena violascens* Thomson, 1870 är en synonym till *Andrena fulvida* Schenck, vilket korrigerar tidigare, merendels utländska antaganden.