The type material of Swedish bees (Hymenoptera, Apoidea) I.

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Sweden with Carl von Linné is the cradle of Systematics and therefore also the origin of a disproportionate part of the taxonomic type material. Bees are no exception. This report is the first part of an examination, including taxonomic revision, of the actual, reputed or potential bee type material of Swedish origin. Focus is on the status, type locality, present condition, depository and history. Here, a total of 20 original specific taxa have been studied. Lectotypes are designated for 13 whereby it is stated that seven epithets are valid (bold), viz. *Andrena cincta* Nylander 1848, *A. clypearis* Nylander 1848, *A.* ***subopaca*** Nylander 1848, *Coelioxys temporalis* Nylander 1848, *Colletes suecica* Aurivillius 1903, *Halictus* ***sexnotatulus*** Nylander 1852, *Heriades* ***breviuscula*** Nylander 1848, *Kirbya* ***melanura*** Nylander 1852, *Megachile apicalis* Nylander 1848 which replacement name *Megachile* ***analis*** Nylander 1852 has the same type, *Nomada cincticornis* 1848, *N.* ***obtusifrons*** Nylander 1848, *Prosopis armillata* Nylander 1848 and *Rhophites* ***halictulus*** Nylander 1852. Especially, *Kirbya melanura* is found to be a senior synonym of *Cilissa wankowiczi* Radoszkowski 1891. The valid name of the species is *Melitta melanura* (Nylander) and its type locality the island of Gotland in the Baltic.

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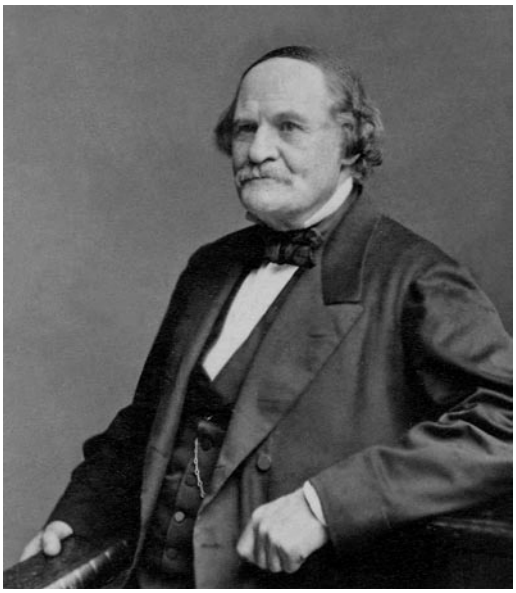
Introduction

Universality and stability in scientific names require that any legitimately published taxon has a fixed and recognized status. Sweden's early great role in Systematics resulted in a relatively large number of original descriptions of bee species being based on material collected from this country (e.g. Linné 1758, 1761, 1767, Dahlbom 1832, Zetterstedt 1838, Nylander 1848, 1852a, 1852b, Thomson 1870, 1872). This material is presently in a highly diverse state in relation to modern taxonomy where type concepts play a central role. There are a number of more or less modern revisions of one or more species in certain genera, e.g. *Coelioxys* (Erlandsson 1955), *Sphecodes* (Kjellander 1959), *Bombus* (Løken 1966, 1973, 1984, Ander 1967, Svensson 1979, Løken & al. 1994, Anonymous 1996), *Halictus* and *Lasioglossum* (Ebmer 1976, 1982, 1988), *Hylaeus* (Erlandsson 1981), *Osmia* (Tkalců 1983) and *Nomada* (Schwarz 1986a-c). Meanwhile, revisions are lacking for many taxa. In such cases original material has never been re-studied or found in the museums.

All bee taxa based on Swedish material, whether re-studied or not, have been subject to taxonomical considerations manifested in the leading international literature (e.g. Warncke 1986, Schwarz & al. 1996). The recently started national project on all of Sweden's multicellular species has necessitated an examination of which material is actually name-bearing and providing



Figur 1. Carl Henrik Boheman. After a military career in Jönköping, where he had attained the rank of captain in 1838, Boheman took on with "iron diligence" (Stål 1873) to arrange and enlarge the insect collections in the Museum of Natural History, Stockholm. His immense collecting was pivotal for the early exploration of the Swedish bees. Courtesy of Bert Viklund, NHRS.

valid names. The present report is the first part of a critical examination of the actual, reputed or potential type material of Swedish bees.

The purpose of the work was manifold. First, to examine and if necessary, on the basis of ICZN (www.iczn.org/iczn, ICZN 1999), revise any taxonomical status of the material. Second, to provide lectotype designations of previously unrevised taxa. Third, to state the type locality, original labelling, condition and identity of type specimens. A short survey of the scientists and their numerical Swedish contributions is provided here.

History

Carl Linnaeus (1707–1778, from 1757 by the name of C. von Linné) started the bee fauna research in this country. In 1742 he published a list briefly describing 14 bee species (interpretation by LAN). These had been found during his student years in Uppsala 1728–1734 (Linnaeus 1742: 97). Between 1758 and 1767 Linné described 31 valid Swedish bee species (including of course the honeybee *Apis mellifera*), making up roughly 10% of the currently known national bee fauna. A still enigmatic species, viz. *Apis rybyensis*, was described a few years later (Linné 1771). Most of Linné's authentic material including insects was purchased by sir J.E. Smith and shipped to England in 1784. The collection is now with the Linnean Society at Burlington House in Piccadilly, London. The British taxonomists soon realized the collection's value as nomenclatural rectifyer. The first to study Linné's Swedish bees was Kirby (1802), followed by Smith (1851), Richards (1935) and Day (1979). Two Nordic researchers have studied material after it left Sweden, viz. the Finnish (later famous botanist) William Nylander (1822–1899) in June–July 1851 (Norrlin 1913), and the Norwegian bumblebee specialist Astrid Løken (b. 1911) in the early 1960'ies. Day (1979) carried out the fixation of a name-bearing type of most of Linné's bee species.

The Dane Johann Christian Fabricius (1745–1808) was Linné's student in Uppsala 1762–1764 and became the next to describe new species from Swedish bees, viz. *Melitta haemorrhoidalis* and *Bombus lapponicus* (Fabricius 1775, 1793). According to a generic survey with species numbers by Carl Fredrik Fallén (1764–1830), the number of known bee species in Sweden was 101 (Fallén 1813). Important contributions were made by Anders Gustav Dahlbom (1806–1859), who monographed the Scandinavian bumblebees in 1832 (adding *Bombus consobrinus* and *B. balteatus*), and Johan Wilhelm Zetterstedt (1785–1874). In 1838 Zetterstedt described six new species of solitary bees from mainly northern sites and mentioned in all 124 bee species from Sweden. By the mid 19th century young William Nylander in Helsinki became the authority of North European bees and received material both from Dahlbom at the Zoological Museum in Lund and Carl Henrik Boheman (1796–1868, Fig. 1) at the Museum of Natural History in Stockholm. In a complete Fennoscandian treatment published in 1848 and after visiting several European museums including the one in Stockholm 1850–1851 and finally revising his previous work, Nylander

(1852a, 1852b) supplied the descriptions of 15 new species from material of Swedish origin. He reported that (by 1851) the total number of known bee species in Sweden was 152. This number increased in 1854 by the description of *Bombus cingulatus* from Norrbotten by Peter F. Wahlberg (1800–1877, less famous than his younger brother Johan August (1810–1856) who financed natural history expeditions in Africa by ivory hunting and was eventually killed by an elephant. Johan August's trampled, broken gun is exhibited at the Swedish University of Agricultural Sciences, Uppsala).

The last substantial number of bee species described from material of Swedish origin was presented by Carl Gustaf Thomson (1824–1899), Sweden's no doubt most skilful, sharp-eyed (using a 18X microscope!) and productive insect taxonomist. With his contribution (1869, 1870, 1872, 1888), a further 12 species were added and the number of known bee species was nationally elevated to 211. Since Thomson's days, only three valid specific taxa have been described from Swedish material: *Panurginus romani* by Aurivillius (1914), *Lasioglossum boreale* by Svensson & al. (1977) and *Osmia svenssoni* by Tkalců (1983). Also a few subspecific taxa from Swedish material have gained acceptance, e.g. *Bombus pascuorum gotlandicus* described by Erlandsson (1953). The number of known bee species in Sweden is 294 (L.A. Nilsson unpubl. check-list September 2007). The increase from southern species has lately been 1-2 per year (Swedish WildBee Project, ArtDatabanken, Uppsala). The numbers of species given above must, however, from taxonomical or other reasons be seen as approximate.

Material and methods

Information on any Swedish bee material that constituted types or potential types of any status was searched in the literature (listed in Nilsson 2003). The search was strictly delimited to material with an origin within the present national borders (thus excluding Finland and Norway before 1809 and 1905, respectively) except in cases where no typification existed and the auctor of a taxon had mentioned also foreign specimens as part of the type series. The actual material was then searched and studied during visits to the respective institutions, through loans or by other means. The abbreviations of the corresponding institutions mentioned in the present paper are:

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

LSL = Linnean Society, London,

NHRS = Swedish Museum of Natural History, Stockholm,

ZMH = Zoological Museum, Helsinki,

ZML = Zoological Museum, Lund, and

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

The taxonomical status, type locality, original labelling, quality and identity of the name-bearing specimen or other qualified material were examined on the basis of the current nomenclatural rules (i.e. ICZN 1999).

The examined taxa in the present paper have been arranged alphabetically below each family. The families of bees follow Michener (2000).

Results

For easy access of the essential results on each taxon the information has been organized into two paragraphs. The first consists of a single sentence with five parts due to semicolon divisions. Principally, the parts mention the taxonomical status, type locality, original labelling, quality and identity of the name-bearing specimen or other type material primarily examined, respectively. Specifically, the 1st part lists the corroborated or proposed taxonomic status as well as the sex, depository and, within boldface brackets, action taken. The 2nd part lists the type locality, viz. country, county, province and place (geographical coordinates are additionally given for small places) according to the original description or/and labelling. One intention has been to modernize the geographical information for possible use by institutions responsible for biodiversity conservation. Locals should be proud and concerned about their heritage of type populations, i.e. taxonomy and biodiversity deserve to matter in society. Thus, "län" (i.e. county) and "kommun" (i.e. municipality or district), abbreviated "kn", have been specified whenever possible. The 3rd part states the original (or replacement) labelling born on the pin of the specimen. Successive labels are separated

by a forward slash (/) and style (hand or printed) of label(s) is indicated within brackets. The 4th part states the present quality of the specimen. The 5th part mentions the currently valid name according to modern taxonomy.

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.

COLLETIDAE

Colletes suecica Aurivillius 1903: 214

Lectotype ♀ NHRS **[here designated]**; SWEDEN, Gotlands län/kn, Gotland; *Gl./ Bhn.* [printed, C.H. Boheman]; good, except right antennal segments 3-12 lost; *Colletes floralis* Eversmann, det. L.A. Nilsson 2005.

The taxon was described from both sexes with reference to material from "Gotl., Ög., Stockh." (= Gotland, Östergötland and Stockholm). A search in NHRS revealed that Coll. Boheman contained the authentic material used by Aurivillius. Seven specimens (2♀♀5♂♂) were found to qualify as syntypes. A ♀ is here selected as lectotype and labelled so. A further label of the lectotype reads: "Naturhistoriska Riksmuséet Stockholm loan no 952/05". The remaining six bees (3♂♂1♀ labelled "*Gl.*"/ "*Bhn.*" (= Gotland, C.H. Boheman), 1♂ "4/7"/ "O.G."/ "*Hagl.*" (= Östergötland, E. Haglund) and 1♂ "*Hlm*"/ "*Stål*" (= Stockholm, C. Stål)) are here labelled as paralectotypes. That *C. suecica* is a junior synonym of *Colletes floralis* Eversmann 1852 has been presumed (as in e.g. Forsius & Nordström 1921: 71, Noskiewicz 1936: 437, Warncke 1978: 354, Schwarz & al. 1996: 21). The identity of the type material conforms with the current interpretation of *C. floralis* (as in e.g. Amiet & al. 1999). The typification validates the synonymy.

Hylaeus brevicornis Nylander 1852a: 95

Lectotype ♀ NHRS **[examined]**; SWEDEN, Småland; *Sm./ Bhn.* [printed, C.H. Boheman]; good, except left hindwing lost; *Hylaeus brevicornis* Nylander, det. L.A. Nilsson 2005.

The taxon was described from both sexes on the basis of material from "Bohusia, Vestrogothia et Smolandia D. Boheman". Erlandsson (1981: 177) designated and labelled a ♀ as lectotype and labelled 2♂♂ as paralectotypes. He incorrectly reported the collector as "C. A. Boheman" and, on one of the paralectotypes, "*Bhn*" as an abbreviation of the province of Bohuslän.

Hylaeus pictipes Nylander 1852a: 95

Lectotype ♀ NHRS **[examined]**; SWEDEN, Västra Götalands län, Västergötland; *V.G./ Dn.* [printed, J.W. Dalman]; abdomen, right mid- and hindleg lost, and right forewing broken; *Hylaeus pictipes* Nylander, det. L. Norén 2005.

The taxon was described from both sexes on the basis of material "E Museo Dalmanni…Vestrogothia". Erlandsson (1981: 177) designated and labelled a ♀ as lectotype and also labelled a ♂ as paralectotype. The species is nationally redlisted as NT, near threatened (Gärdenfors 2005).

Prosopis armillata Nylander 1848: 189

Lectotype ♀ ZMH **[here designated]**; SWEDEN, the southernly part; Svecia aust./ Dahlbom [hand]/ Coll. Nyldr [printed]; right hindleg lost and abdomen glued to thorax; *Hylaeus hyalinatus* Smith, det. L.A. Nilsson 2006.

The original description included both sexes and that the material originated from "Scania, Blekingia, Ostrogothia" (Dahlbom) and "Smolandia" (Boheman). In ZMH there stand 2♂♂ and 1♀ that qualify as syntypes. The ♀ is here selected as lectotype and labelled so. It bears also the label "Mus. Zool. H: fors Spec. typ. No 5133 *Prosopis armillata* Nyl.". One ♂ bears the same basic labelling (replacement for the original) as the ♀ and also the label "Mus. Zool. H:fors Spec. typ. No 5132 *Prosopis armillata* Nyl.". The second ♂ has the following sequence of basic labels: a small greenish quadrate tag/ ♂/ Smålandia/ Boheman/ Coll. Nyldr/ 49. It bears also the label "Mus. Zool. H:fors Spec. typ. No 5134 *Prosopis armillata* Nyl.". The 2♂♂ are here labelled as paralectotypes. Noteworthy, Boheman used a small greenish tag to indicate the province of Småland (B. Viklund pers. comm. 2005). He did not use printed labels "Småland" and "Boheman" but standardly "*Sm.*" and "*Bhn.*" (LAN pers. obs. in NHRS). Boheman's original labels, except the green tag, have apparently been replaced by Nylander or ZMH. The three specimens conform with the current common interpretation of *Hylaeus hyalinatus* Smith 1842 (as in e.g. Dathe 1980, Koster 1986, Amiet & al. 1999). This synonymy has been presumed for long (Dalla Torre & Friese 1895: 23, Elfving 1951: 79, Warncke 1972: 758, Dathe 1980: 280, Schwarz & al. 1996: 14). The typification validates the synonymy.

ANDRENIDAE

Andrena cincta Nylander 1848: 220

Lectotype ♀ ZMH **[here designated]**; FINLAND, Uusimaa, Helsinki; ♀/ H:fors/ W. Nyl./ W. Nyld. [printed]/ *cincta* Nyl [hand, W. Nylander]; excellent,

complete; *Andrena fuscipes* (Kirby), det. L.A. Nilsson 2006.

The taxon was described from both sexes and with reference to material from "Ad Helsingfors..1845" (Nylander) and "E Suecia D. Dahlbom". Nylander wrote "mihi." after his epithet *cincta* but subsequently made a doubtful reference to another taxon, viz. "*M. fuscipes* Kirb. 2, 136, 75,?". He later (1852b: 256), after studying Coll. Kirby and other material in London June–July 1851, treated his taxon as a junior synonym of *Andrena fuscipes* (Kirby). *Andrena cincta* Nylander is also a junior primary homonym of *Andrena cincta* Fabricius 1781. No Swedish material labelled as *A. cincta* or *A. fuscipes* has been found in ZMH (L. Norén pers. comm. 2003). In the Coll. Fennica at ZMH, 3♂♂ and 1♀ bear the adequate data and qualify as type material. The ♀ is here selected as lectotype and labelled so. It bears also the label "Mus. Zool. Helsinki Loan No. HY 2006 1964". The 3♂♂ are here labelled as paralectotypes. The basic labelling of 2♂♂ are "H:fors"/ "W. Nyl."/ "Coll. Nyldr"/ "d. 6/VIII" while on 1♂ "♂"/ "H:fors"/ "W. Nyl."/ "W. Nyld."/ "*cincta* Nyl."/ "*A. fuscip*". The material conforms with the current interpretation of the species *Andrena fuscipes* (Kirby 1802) (as in e.g. Dylewska 1987, Schmid-Egger & Scheuchl 1997). The taxonomical origin of *A. cincta* had already before the typification been listed from Finland only (Warncke 1967: 260, Dylewska 1987: 599, Gusenleitner & Schwarz 2002: 301). The typification validates the synonymy.

Andrena clypearis Nylander 1848: 215

Lectotype ♀ ZMH **[here designated]**; SWEDEN, the southernly part; Svecia aust./ Dahlbom [hand]/ Coll. Nyldr [printed]/ 74 Dlbm [hand]; excellent, complete; *Andrena fucata* Smith, det. L.A. Nilsson 2006.

The taxon was described from the ♀ only, and with reference to material from both Finland – "Helsingfors" (Nylander), "Tavastia" (Kekoni), "Ostrobottnia ad G:la Carleby" (Hellström) – and "Suecia" (Dahlbom). In his next publication (1852a: 100) Nylander wrote that his *A. clypearis* conformed rather well with the species *Melitta nitida* as described by Kirby. In Coll. Kirby (BMNH) there are two well-preserved "*Melitta nitida*" that are "typical *nitida*" (G. Else pers. comm. 2006), i.e. *Andrena nitida* (Müller) according to present common interpretation. After having studied material in Coll. Kirby and other foreign collections, Nylander eventually concluded (1852b: 254) that his *A. clypearis* was a junior synonym of *Andrena fucata* Smith. Schenck (1853: 275, 1861: 211/243) nevertheless accepted *A. clypearis* as a separate species and attempted to find distinctive characters. In the present study, a total of 11 specimens, 5♂♂ and 6♀♀, were obtained from ZMH. Among these, 2♀♀ were found to qualify as unambiguous syntypes. A ♀ is here selected as lectotype and labelled so. It also bears the label "Mus. Zool. H:fors Spec. typ. No 5141 *Andrena clypearis* Nyl.". The second ♀ is here labelled as paralectotype. It bears the same basic labelling as the lectotype and also "Mus. Zool. H:fors Spec. typ. No 5142 *Andrena clypearis* Nyl.". The type material conforms with the current common interpretation of *Andrena fucata* Smith 1847 (as in e.g. Dylewska 1987, Schmid-Egger & Scheuchl 1997). The synonymy has often been listed and, despite the lack of a type designation, several authors have exclusively mentioned Finland as the type area of *A. clypearis* (viz. Warncke 1967: 261, Dylewska 1987: 627, Gusenleitner & Schwarz 2002: 288). The typification validates the synonymy and provides a correct type locality.

Andrena subopaca Nylander 1848: 221

Lectotype ♀ ZMH **[here designated]**; FINLAND, Pohjanmaa, Kokkola; ♀/ Ostrob./ Hellström/ W. Nyld. [printed]/ *subopaca* Nyl. [hand]; excellent, complete; *Andrena subopaca* Nylander, det. L.A. Nilsson 2006.

Nylander described the taxon from both sexes and cited material from "Helsingfors" and "Karelia (paroec. Uguniemi)" (Nylander), "G:la Carleby" (Hellström), "Ex Holmia D. Boheman, e Scania D. Dahlbom" and "E Sibiria D. Sahlberg". In ZMH a total of five specimens were found as potential type material. However, 1♂ (labelled "Mus. Zool. H:fors Spec. typ. No 5147 *Andrena subopaca* Nyl.") and 1♀ ("Mus. Zool. H:fors Spec. typ. No 5149 *Andrena subopaca* Nyl.") are *Andrena semilaevis* Pérez (det. L.A. Nilsson 2006). These specimens both lack labelling as to origin and collector and bear a handwritten label "An e Svecia ? annot. J. Sahlb." and "An ex Holmia per Bohem. ? annot. J. Sahlb. recens. Alfken.", respectively. Clearly, both J. Sahlberg and J.D. Alfken were uncertain about the authenticity. Further, the ♀ does not fit Nylander's description passage "abdomen totum aequaliter confertissime microscopice coriaceum subnitidum". They do not qualify as types. A further ♂ ("Mus. Zool. H:fors Spec. typ. No 5148 *Andrena subopaca* Nyl.") lacks origin and collector but is *Andrena subopaca* Nylander according to the common interpretation (see below) of this species (det. L.A. Nilsson 2006). It does not necessarily qualify for type status. The remaining pair qualifies as syntypes and also conforms with current common interpretation of the species *Andrena subopaca* Nylander 1848 (as in e.g. Schmid-Egger & Scheuchl 1997, Gusenleitner & Schwarz 2002). The ♀ is here selected as lectotype and labelled so. It bears also the label "Mus. Zool. H:

Figure 2. ***Panurginus romani*** *Aurivillius, a taiga bee species described from Hälsingland. This ♀ (8 mm), on a* ***Tussilago*** *leaf a few seconds before she enters her nest, carries a characteristic load of mixed nectar and pollen of the main food-plant raspberry* ***Rubus idaeus*** *(Rosaceae). Photo by L.A. Nilsson.*

Figure 3. ***Dufourea halictula*** *(Nylander) ♀ (left) and ♂ (4-5 mm), a bee species described from Degeberga in eastern Skåne. It is specialized on* ***Jasione montana*** *(Campanulaceae). Photo by L.A. Nilsson.*

fors Spec. typ. No 5146 *Andrena subopaca* Nyl.". In addition, it bears a folded strip of paper with "Dies Ex. ist nach m. Meinung dies auf Seite 222 erwähnte Stück von Hellström." handwritten by J.D. Alfken. The ♂ specimen is here labelled as paralectotype. It bears also the labelling "H:fors"/ "d. 11/vii"/ "W. Nyland."/ "H-fors"/ "*subop*."/ "Mus. Zool. Helsinki Loan No. HY 2006 1951". The typification provides authentic material.

Panurginus romani Aurivillius 1914: 96.
Holotype ♀ NHRS **[examined]**; SWEDEN, Gävleborgs län, Hälsingland; *Hls*. [printed]/ Roman [hand, P.A. Roman]; good, except right hindleg lost; *Panurginus romani* Aurivillius, det. L.A. Nilsson 2005.

The taxon was described by Per Olof Christopher Aurivillius (1853–1928), professor at NHRS, from a unique ♀ collected in the province of Hälsingland by Per Abraham Roman (1872–1943), an assistant at the museum. Aurivillius gave no further information on locality or date. According to Erlandsson (1958: 43), the type specimen was almost certainly collected in the surroundings of Järvsö or Delsbo because Roman visited Aurivillius and the resident collector Johan Rudolphi (1851–1921) in these villages, respectively, during a trip in 1913. Rudolphi was known for selling insects in candy cornets. The holotype specimen bears the labels "Type" and "Typus". The ♂ of the species was found (leg. Oscar Sjöberg) already in 1915 at Ludvika in the province of Dalarna further south. This male material was in 1927 sent by Anton Jansson (1880–1963), a journalist and entomologist in Örebro, to the bee taxonomist J.D. Alfken in Bremen, Germany. Alfken (1927: 139) described the male but kept the material. After Alfken's death, Stellan Erlandsson (1902–1989) at NHRS managed, in exchange for own material, to get the described male back from the Zoological Department of the Humboldt-University in Berlin. Erlandsson subsequently (1958: 43) mentioned a "♂ allotypus". The actual specimen (in NHRS) bears the label "Paratype" (LAN pers. obs. 2005). Any paratype cannot be accepted, however, since there never existed more than one authentic specimen. The species (Fig. 2) constitutes a distinctive element of the fauna of the central and northern woodlands, ca. 80% of its reported localities being Swedish (LAN unpubl. data).

HALICTIDAE

Halictus sexnotatulus Nylander 1852b: 239
Lectotype ♀ NHRS **[here designated]**; SWEDEN, Västra Götalands län, Västergötland; *V.G./ Dn*. [printed, J.W. Dalman]; left antenna, right antennal segments 4-12, both frontlegs, right hindtarsus, and left hindtarsus with segments 4-5 lost, and abdomen glued to thorax; *Lasioglossum sexnotatulum* (Nylander), det. A.W. Ebmer 1975.

Nylander, referring to the original material in question in NHRS as "e Suecia memorata", presented *H. 6-notatulus* (1852b: 239) as a new name for *Halictus sexnotatus* Walckenaer sensu Nylander (1852a: 97). According to Norrlin (1913: 9), Nylander had visited Stockholm from August to the beginning of

October 1850. A search in NHRS 2002 revealed that the original material available to Nylander consisted of 2♀♀ that had belonged to Johan Wilhelm Dalman (1787–1828), the former curator. Ebmer (1975: 71-72) reported that (according to information from S. Erlandsson) there was no original material present in NHRS, a circumstance that made him select a neotype. According to ICZN Article 75.8., a neotype is set aside in the case of discovery of original type material. Ebmer's neotype is one of Dalman's 2♀♀. It is here re-selected, but now as lectotype and labelled so. The second ♀ has identical original labelling and is here labelled as paralectotype. A diagnosis of *Halictus sexnotatulus* is found in Blüthgen (1958: 193). Any statement that Finland is the type locality is erroneous (as in Warncke 1973b: 286). The present typification corrects for the discovery of original type material. The species is nationally redlisted as DD, data deficient (Gärdenfors 2005).

Rhophites halictulus Nylander 1852b: 236.
Lectotype ♀ NHRS **[here designated]**; SWEDEN, Skåne län, Skåne, Kristianstads kn, Degeberga, 55°50´N/ 14°05´E; *Sc. or./ Bhn.* [printed, C.H. Boheman]; head, right hindleg, and left hindtarsus with segments 3-5 lost, cuticle faded orange-brown; *Dufourea halictula* (Nylander), det. L.A. Nilsson 2005.

The taxon was described from both sexes "in Scania cepit Cel. Boheman". In Coll. Nylander (ZMH) there is no such Swedish material (L. Norén pers. comm. 2003). It has been assumed that authentic material is no longer in existence (Ebmer 1976: 4). However, Boheman (1853: 187-188) communicated exemplarily his capture of the type specimens at Degeberga in eastern Skåne 6-11 July 1851 and that these bees had been described by "Dom. W. Nylander". In the same paper Boheman also provided a species description which is more detailed than Nylander's (but of course formally redundant). In Coll. Boheman (NHRS) there stand 2♀♀ of which one is labelled "*Sc. or.*" (= *Scania orientalis* = eastern Skåne) and "*Bhn.*" (= C.H. Boheman). The ♀ is syntype material and here designated as lectotype and labelled so. It also bears the label "Reg beedata SE ArtDatabanken 12958". The lectotype conforms with the current interpretation of the species *Dufourea halictula* (Nylander) (as in e.g. Baker 1994, Amiet & al. 1999, Ebmer 1999). Apparently, earlier attempts to obtain any authentic material for the fixation of this taxon have been unsuccessful (cf. Ebmer 1984: 350, 1988: 681, 1999: 184). The typification provides recognition of authentic material and a specified type locality. The species (Fig. 3) is nationally redlisted as VU, vulnerable (Gärdenfors 2005).

Figure 4. ***Kirbya melanura*** *Nylander 1852a: 101, lectotype (NHRS) (12.5 mm). The specimen is a well-preserved ♀ collected in Gotland 1848 or 1849 by Carl Henrik Boheman. Photo by L.A. Nilsson.*

MELITTIDAE
Kirbya melanura Nylander 1852a: 101.
Lectotype ♀ NHRS **[here designated]**; SWEDEN, Gotlands län/kn, Gotland; *Gl./ Bhn.* [printed, C.H. Boheman]; excellent, complete and beautiful (Fig. 4); *Melitta melanura* (Nylander), det. L.A. Nilsson 2005.

The taxon was described from the ♀ only and with no information on locality or collector. However, Nylander wrote (1852a: 93, manuscript submitted on 18 November 1850) that the descriptions in his paper resulted from studies of material in Stockholm (NHRS). Nylander had visited Stockholm from August to the beginning of October 1850 (Norrlin 1913:9). In Nylander's next paper (1852b: 268, manuscript submitted on 8 December 1851) he mentioned that the material of the species had been collected in Gotland by C.H. Boheman and also described the ♂ of *Kirbya melanura*. According to Stål (1873: 509), Boheman collected in Gotland both 1848 and 1849. In Coll. Boheman (NHRS) there stand a total of three specimens (2♀♀ and 1♂) below the cabinet species label "*melanura* Nyl.". They all bear the original labelling "*Gl.*"(= Gotland) and "*Bhn.*"(= C.H. Boheman). The 2♀♀ conform to the description and constitute syntypes of *Kirbya melanura*. One ♀ is here selected as lectotype and labelled so (Fig. 4). The second ♀ is here labelled as paralectotype. The lectotype and paralectotype as well as the ♂ specimen are identical to *Cilissa wankowiczi* Radoszkowski 1891: 237 syn. nov., presently *Melitta wankowiczi* according to the usual interpretation of this species (as in e.g. Warncke 1973a, Schwarz & al. 1996, Celary 2005, Scheuchl 2006). This fact has been verified by the comparison between the authentic material of *Kirbya*

melanura and the species *Melitta wankowiczi* collected recently (1981–2006) in Gotland (LAN pers. obs. 2006). In addition, a comparison between a pair of the latter recent Gotlandic material and syntype material of *Cilissa wankowiczi* has indicated that they are conspecific (W. Celary pers. comm. 2005). *Kirbya melanura* Nylander was combined as *Melitta melanura* (Nylander) already by Dalla Torre (1896: 190). Aurivillius (1903: 190), in his complete treatment of the Swedish bee fauna, used the material in Coll. Boheman and mentioned an exclusive occurrence of *Melitta melanura* in Gotland (the too small body length "10–11 mm", however, was apparently extracted from Friese (1901: 165)). The (desk) misinterpretation that *Kirbya melanura* Nylander is a junior synonym of *Melitta tricincta* Kirby was introduced by Perkins (1917: 51). Probably, Perkins was misled by the fact that *Melitta melanura* sensu Friese (1901: 164) = *Melitta tricincta* Kirby (D. Michez in litt. 2007). The incorrect synonymy was then repeated (viz. Blüthgen 1930: 775, Stoeckhert 1933: 192, Erlandsson 1960: 127, Warncke 1973a: 107, Richards 1978: 137, Erlandsson & al. 1988: 162, Schwarz & al. 1996: 91, Celary 2005: 59, Scheuchl 2006: 177). According to ICZN (Article 23.) the senior synonym has precedence. The valid use of the name *Melitta melanura* in a major work after 1899 and the very few recent papers and authors of work on the extremely rare European bee species *Melitta wankowiczi* are facts that do not support any reversal of precedence in this case (Article 23.9.). The epithet *melanura* should superpose *wankowiczi* in future usage. The character-relevant and easy-spelled name will, luckily, far better serve long-term biological understanding per se, an area not regulated by the current Code. The purpose of the typification is recognition of authentic material and the valid name of the species. The species (Fig. 5) is nationally redlisted as EN, endangered (Gärdenfors 2005). Alarmingly, recent observations have indicated that it is critically endangered (LAN pers. obs. 2006).

MEGACHILIDAE

Coelioxys lanceolata Nylander 1852b: 279.

Lectotype ♀ NHRS **[examined]**; SWEDEN, Småland; *Bhn./ Sm.* [printed, C.H. Boheman]; very poor, viz. left antenna, right antennal segments 2-12, right hindleg, right midtibia+tarsus, right hindwing and abdomen (except sternite 1) lost, and head glued to thorax; *Coelioxys lanceolata* Nylander, det. L.A. Nilsson 2005.

Nylander described the taxon from the ♀ only and mentioned that the original material consisted of specimens "Ex Smolandia et Westrogothia in Mus. Holm.". Erlandsson (1955: 184) designated a ♀ collected by C.H. Boheman in Småland as "holotypus". The ♀ bears a red label reading "Typus" only (LAN pers. obs. 2005). It is the lectotype. In addition, Erlandsson designated a ♂ from Småland 1938 as "allotypus". Also the condition of this specimen is very poor, with the head lost and the genitalia largely dissolved on an attached microscopic slide. The illustrated genitalia (Erlandsson 1955: Abb. 2a) are rather different from those in true *C. lanceolata* (viz. Schwarz & Gusenleitner 1999: Abb. 14, LAN pers. obs.; the illustration in Scheuchl (2006: 157), showing a relatively sparse and long lateral fringe of hairs on the gonostyli, however, seems hardly to represent typical *C. lanceolata*). Furthermore, in Erlandsson's identification key (1955: 190) the male of the species has a non-emarginate 4th sternite. True *C. lanceolata* exhibits such an emargination (Schwarz & Gusenleitner 1999, LAN pers. obs.). This indicates that Erlandsson misidentified the male. His allotype was not part of the the type series and should be rejected. Regarding the type series, any old ♀ of the species from Västergötland is lacking in NHRS (LAN pers. obs. 2005). Only in Coll. Thomson (ZML) there is material (1♀) originally labelled "*V.G.*" (= Västergötland) (L. Norén pers. obs. 2005). This specimen bears also a small green quadrate tag and a label "l. n sp" (indeed an abbreviation for "*lanceolata* n. sp."). Probably, the ♀ is part of the type series and was transferred from NHRS to ZML shortly before 1872, the year when Thomson published his major work on bees. Thomson himself is the likely person who made the transfer. The species (Fig. 6) is nationally redlisted as DD, data deficient (Gärdenfors 2005). It is widely recorded among the woodland provinces but very rarely seen; only some 20 Swedish individuals are known (LAN unpubl. data 2007).

Coelioxys temporalis Nylander 1848: 253

Lectotype ♀ ZMH **[here designated]**; SWEDEN, the southernly part; Svecia aust./ Dahlbom [hand]/ Coll. Nyldr [printed]/ Snb №. 50 Dlbm. [hand]; good, except left antennal segments 8-12 lost; *Coelioxys conoidea* (Illiger), det. L.A. Nilsson 2006.

The taxon was described on the basis of the ♀ found in "Svecia australiori" by A.G. Dahlbom. Since Dahlbom was stationed in Lund the specimen is with all probability from Skåne. In Coll. Nylander (ZMH) there stands a single ♀ specimen. It is here designated as lectotype and labelled so. The specimen bears also the pinned label "Mus. Zool. H:fors Spec. typ. No 5159 *Coelioxys temporalis* Nyl.". That *C. temporalis* is a junior synonym of *Coelioxys conoidea* (Illiger 1806) has been presumed (as in e.g. Ger-

staecker 1869: 169, Dalla Torre 1896: 484, Warncke 1992: 46, Schwarz & al. 1996: 112). The lectotype conforms with the current common interpretation of *C. conoidea* (as in Amiet & al. 2004, Scheuchl 2006). The typification validates the synonymy.

Heriades breviuscula Nylander 1848: 272

Lectotype ♂ ZMH **[here designated]**; SWEDEN, Skåne län, Skåne; Scania [printed]/ Dahlbom [hand]/ Coll. Nyldr [printed]/ 43. [hand]; abdomen, both midlegs, right hindleg and left hindtarsus lost; *Stelis breviuscula* (Nylander), det. L.A. Nilsson 2006.

The taxon was described from the ♂ only and with the material specification "E Scania D. D:r Dahlbom". In Coll. Nylander (ZMH) there stands a single ♂ which remaining parts conform with the description. It is here designated as lectotype and labelled so. It also bears the label "Mus. Zool. H:fors Spec. typ. No 5169 *Heriades breviuscula* Nyl.". The specimen conforms with the current common interpretation of the species *Stelis breviuscula* (Nylander) (as in Amiet & al. 2004, Scheuchl 2006). The typification provides authentic material.

Megachile apicalis Nylander 1848: 257 and *Megachile analis* Nylander 1852b:275

Lectotype ♀ ZMH **[here designated]**; FINLAND, Pohjanmaa, Oulu; Uleåborg/ W. Nyl./ Coll. Nyldr [printed]; right hindtarsus with segments 3-5 and right antenna with segments 6-12 lost, spot on left eye burst open; *Megachile analis* Nylander, det. L.A. Nilsson 2006.

The original description of *M. apicalis* Nylander was based on both sexes from Uleåborg in Finland (Nylander) and a ♀ from "Westrogothia" (Boheman). Nylander added "Bohem. (in litt.)." after the name *M. apicalis* thus indicating that it was a pre-existing manuscript name mentioned in writing (a list or letter?) by C.H. Boheman. In Coll. Gyllenhal (ZMU) Box 336 there is a cabinet species label "*Anthophora apicalis* Eg. ♀", to the left of which stand 2♀♀ of *Megachile analis* and 2♂♂ of *Megachile ligniseca* (LAN pers. obs. 2006). Furthermore, Leonard Gyllenhal (1752–1840) invented 17 manuscript names (revealed by his added "Eg." or "M.") of bees in his collection but did not present any species description in this group. Clearly, Boheman had adopted the epithet *apicalis* from Gyllenhal. *Megachile apicalis* Nylander is a junior homonym of *Megachile apicalis* Spinola 1808. Nylander soon (1852b: 275) realized this fact and supplied the justified replacement name *Megachile analis*. A search in NHRS yielded no *Megachile* material labelled *apicalis* although a *M. analis* ♀ was found to bear the original labels "*V.G.*" (= Västergötland) and "*Bhn.*" (= C.H. Boheman). In ZMH, 2♀♀ were found in Coll. Nylander. The left ♀ bears the original hand-written (seemingly by Nylander) labelling "*Megachile apicalis* no. 24 Bhn" and then the labels "Mus. Zool. Helsinki Loan No. HY 4455" and "Lectotypus *Megachile apicalis* Nyl. 1♀ Tkalců det.". The right ♀ bears only the original printed label "305.". In addition, in ZMH 2♀♀ and 1♂ with the labelling "Uleåborg" and "W. Nyl." were located in the Palearctic collection. Altogether the latter 2♀♀ and 1♂, and not with certainty any of the first 3♀♀, constitute authentic material. Tkalců has not published any lectotypification (M. Schwarz pers. comm. 2007). Accordingly, a ♀ from Uleåborg is here selected as lectotype of *M. apicalis* and labelled so. Since *M. apicalis* Nylander and *M. analis* are objective synonyms the two taxa have the same name-bearing type (Article 72.7.). The coat of the specimen is white to yellowish except the occiput, mesonotum and tergites 4-5 which are dark. This conforms well with Nylander's original description and also represents the typical northern colouration of the species. The lectotype bears the additional determination label "*M. analis* Nyl. var *Künnemanni* Alfk. det. P. Niemelä" and the label "Mus. Zool. Helsinki Loan No. HY 2006 1949". The remaining ♀ and ♂ from Uleåborg are here labelled as paralectotypes. The ♀, which lacks abdomen, and the ♂ both bear the same basic labelling as the lectotype above. In all structural aspects the type material of *M. apicalis* Nylander conforms with current common interpretation of the species *M. analis* (as in e.g. Dorn & Weber 1988, Amiet & al. 2004, Scheuchl 2006). The typification provides recognition of authentic material and one single type locality.

APIDAE

Apis muscorum Linné 1758: 579

Neotype ♀ NHRS **[examined]**; SWEDEN, Skåne län, Skåne, Kristianstads kn, Arkelstorp, 56°10´N/ 14°17´E; Sk. Arkelstorp 5.7.1947 B.O. Landin [hand, B.-O. Landin]; good, except right hindleg with tarsal segments 2-5 lost; *Bombus muscorum* (Linné), A. Løken det.

This is a conserved name for *B. muscorum* auct. nec Linné (1758: 579) due to application with neotype designation by Løken & al. (1994) and the decision of ICZN (Anonymous 1996). Linné (1761: 425 and also earlier in Linnaeus 1746: 305) stated the vernacular name "Moss-Humbla" for the species. Linné's original specimen (LSL) is a ♀ of *Bombus humilis* Illiger according to current common interpretation; see Day (1979: 68). The species is nationally redlisted as NT, near threatened (Gärdenfors 2005).

Figure 5. ***Melitta melanura*** *(Nylander) ♀ on its type locality Gotland. The species is perhaps Europe's most critically endangered bee. Photo by L.A. Nilsson.*

Apis terrestris Linné 1758: 578
Neotype ♀ NHRS **[examined]**; SWEDEN, Stockholms län, Uppland, Norrtälje kn, Rådmansö, Västernäs, 59°43´N/ 18°99´E; Upl. Rådmansö Västernäs 7.8.1970 leg. S. Erlandsson [printed]; good, except left midtarsus with segments 4-5 lost and coat a little fat-damaged on rear half of abdomen; *Bombus terrestris* (Linné), A. Løken det.

This is a conserved name for *Bombus terrestris* auct. nec Linné (1758: 578) due to application with neotype designation by Løken & al. (1994) and the decision of ICZN (Anonymous 1996). Linné (1761: 424 and also earlier in Linnaeus 1746: 304) stated the vernacular name "Jord-Humbla" for the species. Linné's original specimen (LSL) is a ♀ of *Bombus lucorum* (Linné) according to current common interpretation; see Day (1979: 74).

Nomada cincticornis Nylander 1848: 182
Lectotype ♀ ZMH **[here designated]**; SWEDEN, Småland; 5 x 6 mm faded paper with unreadable text [hand]/ Smålandia/ Boheman/ Coll. Nyldr/ ♀ [printed]/ 56. [hand]; excellent, complete; *Nomada armata* Herrich-Schäffer, det. L.A. Nilsson 2006.

The taxon was described from both sexes originating from "Karelia" (Appelberg), "Scania" (Dahlbom) and "Smolandia" (Boheman). In Coll. Nylander (ZMH) there stand only 2♀♀, both of which qualify as syntypes. One has the basic labelling as given above and also the label "Mus. Zool. H:fors Spec. typ. No 5126 *Nomada cincticornis* Nyl.". It is here selected as lectotype and labelled so. The second specimen has the following basic labelling: "Svecia aust."/ "Dahlbom"/ "Coll. Nyldr"/ "12."/ "Mus. Zool. H:fors Spec. typ. No 5127 *Nomada cincticornis* Nyl.". It is here labelled as paralectotype. Nylander soon (1852b: 232) realized that his *N. cincticornis* was a junior synonym of *N. armata* Herrich-Schäffer 1839. The synonymy has been listed for long (e.g. Thomson 1872: 199, Schwarz & al. 1996: 152) and is here validated.

Nomada obtusifrons Nylander 1848: 184
Lectotype ♀ ZMH **[here designated]**; SWEDEN, the southernly part; Svecia aust./ Dahlbom [hand]/ Coll. Nyldr [printed]; good, except right hindtarsus with segments 4-5 lost; *Nomada obtusifrons* Nylander, det. L.A. Nilsson 2006.

Nylander wrote that the original material consisted of ♀♀ from "Scania" and "Ostrogothia" (Dahlbom) and a ♂ from "Karelia" (Appelberg). Below the cabinet species label "*obtusifrons*" in Coll. Nylander (ZMH) there stand only 2♀♀ (L. Norén pers. comm. 2003). Both bear the labelling "Svecia aust." and "Dahlbom", and qualify as syntypes. The ♀ labelled "Mus. Zool. H:fors Spec. typ. No 5128 *Nomada obtusifrons* Nyl." is here selected as lectotype and labelled so. The ♀ labelled "Mus. Zool. H:fors Spec. typ. No 5129 *Nomada obtusifrons* Nyl." is here labelled as paralectotype. Both specimens conform with the current common interpretation of the species (as in e.g. Scheuchl 2000). The typification provides recognition of authentic material and one type locality.

Figure 6. ***Coelioxys lanceolata*** *Nylander ♀ (12 mm), a rarely seen parasitic bee species described from Småland and Västergötland. Its host is* ***Megachile nigriventris*** *Schenck. Photo by L.A. Nilsson.*

Psithyrus svaveolens Wahlberg 1854: 209
Lectotype ♀ NHRS **[examined]**; SWEDEN, Östergötlands län, Östergötland; *O.G./ P.Wg*. [printed, P.F. Wahlberg]; Good, except fulvous coat on mid part of tergites 4-5 gone and tergite 3 largely hidden under tergite 2; *Bombus quadricolor* (Lepeletier) ssp. *globosus* (Eversmann), det. L.A. Nilsson 2006.

Ander (1967: 187) located the type material and designated a lectotype. He cited "Wahlberg 1854 p. 209" published in "Öfversigt Kongl. Vetenskapsakadem. förhandl. 11: 7, Stockholm" as the original place of description. In contrast, in the subsequent monographical treatment of the Scandinavian *Psithyrus* by Løken an article by Wahlberg in "Förhandlingar vid De Skandinaviske Naturforskarnes Sjette möte i Stockholm den 14-19 juli 1851" published in 1855, cited as "Wahlberg 1855a: 232", was cited as the original publication (Løken 1984: 23). Løken cited Ander's source as "Wahlberg 1855b", indicating that she deliberately changed original publications. She provided no explanation for the change. According to M. Asp Romefors (pers. comm. 2007) at The Royal Swedish Academy of Sciences in Stockholm, Wahlberg's paper was presented at the Academy's meeting on 13 September 1854. The report of the proceedings of the Academy's meeting on 8 November 1854 states that the "Öfversigt.." for September "från trycket utkommit" (had been issued from printing) since their last meeting (on 11 October 1854). To conclude, both printing and distribution of the part of the "Öfversigt.." with the actual paper occurred in 1854. It is therefore the original publication (ICZN Article 21.5.). Wahlberg (1854) mentioned first "*svaveolens n. sp*." on p. 201 and provided the description on p. 209. Løken (1984: 23) also incorrectly mentioned ZML as the depository of the lectotype.

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Sammanfattning
Genom pionjären Linné och ett flertal nordiska efterföljares arbete är en oproportionerligt stor del av artbeskrivningarna inom många insektgrupper baserade på svenskt typmaterial. Detta gäller även bin (Hymenoptera: Apoidea). Här presenteras först en kort forskningshistorik över taxonomerna och deras bidrag i antal arter räknat och därefter första delen av en granskning och taxonomisk revision av typmaterialet av bin av svenskt ursprung. Någon sådan genomgång har inte gjorts tidigare.

Linnés första presenterade lista över svenska bin 1742 innehöll enligt dagens taxonomi 14 arter. Han kom 1758–1771 att giltigt beskriva 31 svenska biarter. Betydande tillskott från svenskt material gjordes sedan f a av Zetterstedt 1838 (6 arter), Nylander 1848–1852 (15 arter) och Thomson 1870–1872 (12 arter). Under 1900-talet baserades beskrivningar av tre nya bin på svenskt material. Totalt har 73 biarter originalbeskrivits från Sverige. Samtidigt har antalet kända biarter i landet stigit till 294 år 2007. Artantalen måste dock av taxonomiska eller andra skäl ses som ungefärliga.

Granskningens fokus har lagts på taxonomisk status, depositionsplats (institution), typlokal, fysiskt tillstånd (”kvalitet”) samt historia av namnbärande exemplar. I föreliggande rapport har totalt 20 ursprungliga artrangstaxa studerats. Lektotyper utses för 13 varvid det slås fast att sju epitet (i fetstil) är giltiga, nämligen *Andrena cincta* Nylander 1848, *A. clypearis* Nylander 1848, *A.* ***subopaca*** Nylander 1848, *Coelioxys temporalis* Nylander 1848, *Colletes suecica* Aurivillius 1903, *Halictus* ***sexnotatulus*** Nylander 1852, *Heriades* ***breviuscula*** Nylander 1848, *Kirbya* ***melanura*** Nylander 1852, *Megachile apicalis* Nylander 1848 = *M.* ***analis*** Nylander 1852, *Nomada cincticornis* 1848, *N.* ***obtusifrons*** Nylander 1848, *Prosopis armillata* Nylander 1848 och *Rhophites* ***halictulus*** Nylander 1852. Av särskilt intresse är att *Kirbya melanura* befinns vara en äldre synonym till *Cilissa wankowiczi* Radoszkowski 1891. Artens giltiga namn är *Melitta melanura* (Nylander) och dess typlokal Gotland.

Insekternas härjningar i krigstid

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Många böcker har behandlat “insekternas kulturhistoria” i en eller annan form, och fler kommer det att bli; relationen mellan människor och insekter tycks vara ett i princip outtömligt fält och det finns alltid nya synvinklar på det, och nya fenomen att granska ur dessa synvinklar.

Medicinsk entomologi är ett exempel på en “människo/insektkunskap” som etablerat sig som ett eget forskningsfält, med framstående företrädare i t ex Sverige. Inom den fokuseras på hur leddjur som myggor och fästingar sprider sjukdomar och vad man kan hitta på för att hejda detta. Ett speciellt perspektiv, ganska ovanligt och mycket fascinerande, är att se hur denna

relation präglat den mänskliga historien. Det är en sådan **historisk medicinsk entomologi** som presenteras i **Lena Huldéns** bok “**Den sexbente fienden**”.