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Carl Clerck and what became of his spiders and their names

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Abstract

An account is given on the life and entomological achievements of Carl Clerck (1709–1765). Focus is given on his book "Svenska spindlar" from 1757 where binary names for spiders were introduced. In 1856 the spider species described by Clerck were revised by Tamerlan Thorell, who shortly after was able to study Clerck's forgotten spider collection. The surviving material largely confirmed Thorell's previous interpretations. In 1892 Clerck's names were invalidated due to the rules adopted at the 2nd international zoological congress in Moscow in which Linnaeus's Systema Naturae Ed. X of 1758 was established as the starting point for zoological nomenclature. Due to arguments put forth by Pierre Bonnet, the International Commission on Zoological Nomenclature in 1948 recommended that the names in Clerck's book of 1757 should be formally recognized. The case was confirmed by the Commission in 1959. In 1965 Clerck's insect collection, also including his spiders, was rediscovered. The spiders were later studied by Åke Holm, who gave an account of the remaining specimens in the collection in 1978. Their status as type material is considered. The collection is now deposited in the Swedish Museum of Natural History in Stockholm. Presently 53 spider species carry names given by Clerck.

INTRODUCTION

Last year, the 300th anniversary of Carl Linnaeus's birth was heavily celebrated, not least in Sweden, his native country. Being a man of many skills, notably a botanist but also a zoologist, mineralogist, physician, etc., his life and deeds were dealt with from an array of aspects in several books, exhibitions and other activities of various kinds. As well-known as is the life of Linnaeus, as little-known is the life of his contemporary compatriot Carl Clerck, an amateur entomologist at the time when spiders were included among the apterous insects. On this occasion, our interest in Clerck is mainly due to his contribution to arachnology, the book "Svenska spindlar", published in 1757 and the oldest work to be recognized in zoological nomenclature. Last year 250 years had passed since his book appeared. The anniversary, however, passed without much attention. To my knowledge, only two papers highlighted this occasion (Walter 2007, Kronestedt 2007).

In 1738 Linnaeus returned to Sweden from a three-year visit abroad, mainly spent in the Netherlands. During these years he worked intensively, published some of his most important works and became known throughout the learned Europe. After his return to Sweden, he set up a practice as physician in Stockholm, at the same time being very active in his relations with learned and influential countrymen. In May 1739 he began to give public lectures in natural history at the House of the Nobility in Stockholm

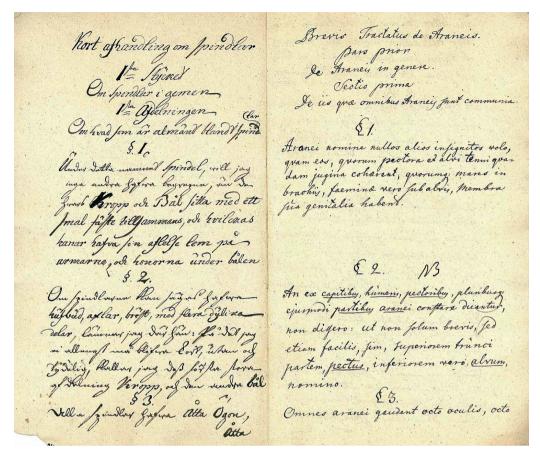


Fig. 1. Clerck's manuscript for his book on Swedish spiders. The title "Kort afhandling om spindlar" (Short treatise on spiders) was omitted in the printed book where this chapter was preceded by a dedication and a preface (without pagination). Center for History of Science, Royal Swedish Academy of Sciences, Stockholm.

and also led excursions in the outskirts of the capital. The same year, in June, he also took part in the founding of the Royal Swedish Academy of Sciences.

It has been documented that Linnaeus was an unusually enthusiastic teacher who really captured his audience. Among his audience in 1739 was Carl Clerck, a simple tax collector in Stockholm. We know comparatively little about Clerck's life and there exists no portrait of him.

On the entomological achievements of Carl Clerck

Clerck was born in Stockholm in 1709. His family name reflects a Scottish ancestry. We know that he began to study at the University of Uppsala in 1726 but had to return to Stockholm the next year because of his father's death. In 1731 he got a position as municipal tax collector in Stockholm. He remained in this occupation for the rest of his life.

We know nothing about Clerck's activities during the decade that followed his acquaintance with Linnaeus in Stockholm in 1739. Linnaeus had moved to Uppsala in 1741.

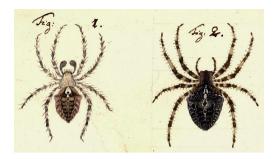


Fig. 2. Original paintings of Araneus angulatus, subadult male (left) and adult female. No scientific name was yet coined on the sheet of paper where this species was depicted and described. From the text [in Swedish] Clerck gives the information that the depicted subadult male was collected on 18 June 1756, became adult on 27 June and was kept till 20 August when it died. (Cf. "Fig. 1" and "Fig. 2" in Fig. 4.)

Clerck's name came into light in 1753 through his first published contribution, a description of the butterfly Poplar Admiral (*Limenitis populi*) which appeared in the annals of the Royal Swedish Academy of Sciences. At that time, Clerck was in contact with Linnaeus by correspondence; the first of his preserved letters dates to 21 May 1753. (Linnaean correspondence online at http://linnaeus.c18.net/). Apart from spiders, butterflies and moths were of most interest to him.

During the mid-1750's, Clerck began preparations for what was to become his book on Swedish spiders. He collected the spiders during excursions in the environs of Stockholm and brought them home for further observation and description. Clerck's manuscript (Fig. 1) is still in existence in the Center for History of Science at the Royal Swedish Academy of Sciences in Stockholm. The same archive also keeps a collection of paper sheets with paintings of spiders (Fig. 2), obviously originals meant for his book, and with text similar to but not wholly identical with the finally printed text. From these texts it appears that the painted spiders were collected during 1756.



Fig. 3. Title page to "Svenska spindlar". The book was printed in Stockholm by Lars Salvius, the foremost printer in Sweden at that time.

Clerck presented the manuscript to his book before the Royal Society of Sciences at Uppsala in the autumn of 1756. Carl Linnaeus was for several years secretary of this Society and recommended the manuscript to be printed. In connection with this, Clerck was elected as a member of the Society.

"Svenska spindlar" or "Aranei Svecici" was printed in the following year (Clerck 1757) in 496 copies (Dal 2001). In English, the full title reads: "Swedish Spiders divided into their principal genera as well as in few and sixty distinct species described and with illuminated figures enlightened, published by the order of the Royal Society of Sciences at Upsala" (Fig. 3). The book comprises 170 pages of text including 16 unnumbered pages with title, dedication to the king and a preface. At the end are six hand-coloured plates, all with illustrations of different spider species (Fig. 4). The last plate also includes two fig-

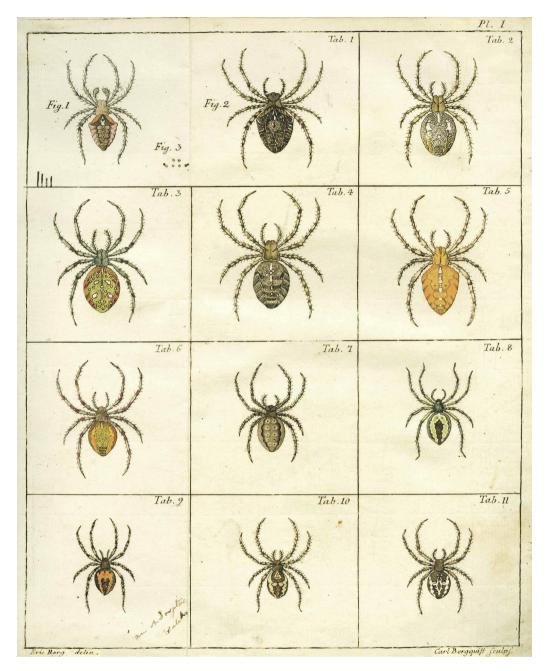


Fig. 4. Plate 1 in "Svenska spindlar". The handcoloured illustrations depict the following species: (upper row, from left:) Araneus angulatus Clerck subadult male and female, A. marmoreus Clerck; (second row:) A. quadratus Clerck, A. diadematus Clerck, A. peleg Clerck (=A. diadematus); (third row:) A. babel Clerck (=A. marmoreus), Nuctenea umbratica (Clerck), Araneus pyramidatus Clerck (=A. marmoreus); (lower row:) A. ocellatus Clerck (=Larinioides patagiatus (Clerck)), Larinioides patagiatus (Clerck), L. cornutus (Clerck).



Fig. 5. From "Svenska spindlar": beginning of Part the first, On spiders in general. (Text as in part of manuscript shown in Fig. 1.)

ures of a false scorpion and one of a harvestman. The text is both in Swedish and Latin, a circumstance which was probably of significance for the book being so well recognized by contemporary entomologists.

Clerck started almost from scratch and his book can be coined a pioneer work. The existing literature on spiders was meagre. In "Svenska spindlar" there are references to Lister (1678), Linnaeus (1746) and Frisch (1728, 1732). Clerck tried in vain to get hold of the book on English spiders by Albin (1736), which some decades later was to be reissued together with his own book (Martyn 1793). He made no reference to Ray (1710), another source in arachnology of those days.

The first part of the paginated portion of "Svenska spindlar" begins with a chapter on what distinguishes spiders from other then-called "insects" (Fig. 5), followed by a chapter with description of a spider's body. The second part commences with a classification of the spiders, notably based upon

their way of living. The first division is between all aerial spiders and the single aquatic species. Following Lister (1678), the aerial spiders were divided into two groups: those which make webs and those which do not. The web-builders were in turn divided into three "genera": those which make round vertical webs (Verticales), those which make irregular webs (Irregulares) and those which make close webs, woven like cloth (Textores). In accordance with Lister (1678), spiders without webs were classified into three so-called "genera": Lupi, Phalangia and Cancriformes. Lupi corresponds to present-day Lycosidae and Pisauridae, Phalangia to Salticidae. Laterigrade species, i. e. of present-day Thomisidae, Philodromidae and Sparassidae, were placed in Cancriformes. The largest part of the book contains a presentation of the so-called "genera" and descriptions of the species under each such "genus". Each species was given a trivial name, i. e. a specific name, and it is clear that Clerck used the trivial names in combination with the group name Araneus, not with the names which he used for his so-called "genera". Why Clerck used the name Araneus instead of Aranea as a group name for spiders is not clear to me. In fact, Linnaeus had used both name forms in his earlier works. Maybe Clerck was influenced by Linnaeus's then newly issued book (Linnaeus 1754) in which the name Araneus was used for the sole mentioned spider species ("Araneus avicularius"). Besides, in the very same book trivial names for animals were consequently used for the first time and, moreover, it had parallel texts in Latin and Swedish, which was to become the case also in "Svenska spindlar".

Interestingly Clerck pointed out the difference in conformation of the palps in male spiders. He found that the "end of the palps" in the males differ between species and illustrated the male palp for some of the species. It was not until the middle of the next century that the value of the palpal organ as a means of distinguishing species was more generally recognized.

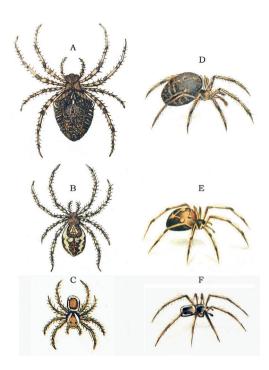


Fig. 6. The same spider species illustrated in Clerck (1757) (A–C) and Martyn (1793) (D–F). A, D: Araneus angulatus Clerck ♀. B, E: Larinioides patagiatus (Clerck) ♀. C, F: Evarcha falcata (Clerck) ♂. (Size of copied illustrations in relation to originals varies.)

66 species were named and fully described by Clerck. In the description of three species, specific names were given to a few deviating forms in case they should prove to be distinct species.

Clerck not only described the shape and colour of his species. When possible, he also studied their biology. In a short paper (Clerck 1761) he described and depicted the tools that he used: tin-boxes with glass bottom for collecting the spiders and a chamber for keeping and observing them.

In 1758 Clerck started another ambitious project which resulted in the publication of the two parts of his "Icones insectorum rariorum" (Clerck 1759, 1764). Despite the title of the work, it only dealt with Lepidoptera. Swedish moths and foreign butterflies were depicted, the latter in order to please the

queen. A number of lepidoptera now carry names with Clerck as author (see Robinson & Nielsen 1983, Mikkola 1985). He did not provide any accompanying texts, just hand-coloured engravings with species names. A facsimile edition of "Icones" with comments on Clerck's life (also on his spider book) was released some twenty years ago (Dal 1989).

Clerck was elected member of the Royal Swedish Academy of Sciences in 1764. He died from phthisis on 22 July 1765, in financial difficulties largely due to his still ongoing "Icones" project for which he had mainly paid from his own pocket.

Linnaeus referred to Clerck for only 12 spider species described in Systema naturae (1758). One may wonder why more species described by Clerck were not included. Holm (1978) stated that the printing of Systema naturae had proceeded too far to encompass more Clerckian species, maybe due to Clerck's (1757: 152) own remark. This is probably not the entire reason because no additional Clerckian species were included in Linnaeus's later works (1761, 1767). Thorell (1856: 5) stated that "quo factum est, ut satis temporis Linnaeo non esset ad Clerckii opus diligentius cognoscendam. Eum vero postea quoque id neglexisse, ex insequentibus editionibus Syst. Nat. et Faunae Suec. intelligi potest." [in fact, Linnaeus did not devote enough time to become thoroughly acquainted with Clerck's work. This is certainly true because of his negligence in the subsequent editions of Systema Naturae and Fauna Svecica.] This is a bit contradictory as Linnaeus at times expressed his high esteem for Clerck. When Linnaeus received his copy of "Svenska spindlar" he wrote to Clerck (in translation) that it was "one of the most beautiful, if not the most beautiful which had been issued in Sweden, is that which I today have had the honour to receive..." [from Carl Linnaeus to Carl Alexander Clerck, 22 April 1757. The Linnaean correspondence, http://linnaeus.c18.net, letter L2178.]

Evidently Clerck's book became well distributed throughout Europe. Towards the end of the 18th century the book was in demand and the English artist Thomas Martyn found it appropriate to reissue it together with Albin's (1736) work on English spiders. Martyn's version is not merely an English translation of most of Clerck's book. Martyn added English names for the included species. All figures were redrawn, showing the spiders in a side-view, and are not comparable with those in the original edition. Maybe Martyn's illustrations are artistically more attractive than Clerck's, but they are certainly less informative (cf. Fig. 6).

On the recognition of Clerck's names in the 19th century

In the course of the 19th century the number of arachnologists increased and more so did the number of descriptions and names of spider species. Rules on priority were not universally recognized. As an example, Blackwall made no reference to Clerck (Parker 1988). More or less insufficient descriptions and illustrations led to the same name being used for different species, as well as more names being given to the same species. With different geographical and educational background as well as taxonomic experience of the experts, their interpretations could diverge. In those years the situation became more and more chaotic. In the mid-1850's, the Swede Tamerlan Thorell appeared on the arachnological stage. Over several years he devoted himself to bringing order to the jungle of synonyms of European spiders (Thorell 1869-70, 1870-73).

Thorell's docent dissertation was a critical revision of the spider species described by Clerck, Linnaeus and De Geer (Thorell 1856), appearing nearly 100 years after Clerck's book. Thorell was born in Göteborg (Gothenburg) in 1830 and lived there until he left for studies at Uppsala University in 1848. It appears that Niklas Westring in Göteborg, author of another book on Swedish spiders (Westring 1861) was somewhat of a tutor to

Thorell (Thorell 1869, Westring 1874). Thus, Thorell was familiar with the spiders and their identification in Westring's collection ever since he was a school-boy.

Thorell was very well acquainted with the Swedish spider fauna at the time when he revised the species described by his compatriot predecessors. Shortly after the appearance of his revision, he learned about the existence of Clerck's spider collection in the house of the Bergian school of gardening in Stockholm (Thorell 1858). The spiders occupied a single drawer in Clerck's insect collection. They were dry and pinned, partly fragmented. Identification labels were missing, just numbers written on pieces of paper without any separate explanation of what the numbers stood for. Thorell was able to find specimens referable to 50 of the species described by Clerck. The entire collection, which also contained species not described by Clerck, was transferred to 87 glass tubes with alcohol.

Clerck's names formally rejected in 1892

The names given by Clerck were in common use when, towards the end of the 19th century, it was decided that they should be rejected on formal grounds. At the second international zoological congress in Moscow in 1892 it was decided that the 10th edition of Linnaeus's Systema naturae (1758) should be the starting point for zoological nomenclature. Opposition was raised among arachnologists, not the least from Eugène Simon who found it impossible to refuse the priority of the names given by Clerck (see Bonnet 1947). Even though Simon later became a member of the International commission on Zoological Nomenclature, Clerck's names remained officially rejected for more than fifty years. A majority of arachnologists, including Simon, continued to use Clerck's names though a minority adjusted to the official ruling. There was, as Pierre Bonnet put it, a "cold war" between the "clerckists" and the "linnéists".



Fig. 7. (Left:) The remaining spiders from Clerck's collection (still property of the Bergius Foundation, Stockholm) are preserved in ethanol in two glass jars deposited in the Swedish Museum of Natural History, Stockholm. (Right:) Glass tubes in the collection containing *Thanatus formicinus* (Clerck), "Dolomedes" sp. [Ekeberg], and Pardosa amentata (Clerck).

In a paper on the rules of nomenclature in araneology (Bonnet 1944, reprinted in 1945), Pierre Bonnet argued with intensity in favour of an official recognition of the names given by Clerck. Two years later, he (Bonnet 1947) addressed the International Commission on Zoological Nomenclature with a detailed petition in favour of the use of Clerck's names. There he provided a lot of numeral facts from his preparatory work for the parts of "Bibliographia araneorum" to follow. The petition was distributed to 64 araneologists for their opinion.

As a result of the referendum among the araneologists, 44 could be classified as true "clerckists", seven were "linnéists" but were ready to adopt Clerck's names in case they were officially recognized, four were opposed to recognizing Clerck's names, two had no opinion, and seven did not reply (cf. also Bonnet 1950a).

The revalidation of Clerck's names

During sessions of the Commission at the 13th International Congress of Zoology in Paris in 1948, the proposed validation of the names in Clerck's book was discussed at length (ICZN 1950a, b, c). The Paris congress then approved the recommendation of the Commission taken on 26 July "that a proviso should be added to Article 26 directing that the generic name Araneus and the specific trivial names for species of the class Arachnida published in 1757 in Clerck's Aranei svecici are to be treated as though they had been published subsequent to the starting point of zoological nomenclature and are to have priority as though they had been published in the year 1758 on some date prior to the publication of the 10th edition of Linnaeus's Systema Naturae." (ICZN 1950d). "La victoire était à nous!" exclaimed professor Bonnet in a paper specially devoted to this success (Bonnet 1950b).

Tube	Name as written on label by Thorell	Current name alt. changed identification by Holm (!)	no. of specimens 2008
1	Epeira umbratica (Clerck)	Nuctenea umbratica (Clerck)	3♀
2	Epeira patagiata (Clerck)	Larinioides patagiatus (Clerck)	12
3	Epeira cucurbitina (Clerck)	Araniella cucurbitina (Clerck)	1♂ 2♀
4	Epeira x-notata (Clerck)	Zygiella atrica (C. L. Koch) (!) see text	20
5	Theridium sisyphium (Clerck)	Theridion sisyphium (Clerck)	1♀
6	Theridium sisyphium (Clerck)	Theridion sisyphium (Clerck)	12
7	Theridium lineatum (Clerck)	Enoplognatha ovata (Clerck)	12
8	Theridium lineatum (Clerck)	Enoplognatha ovata (Clerck)	3♀
9	Theridium cellulanum (Clerck)	Nesticus cellulanus (Clerck)	1\$
10	Linyphia triangularis (Clerck)	Linyphia triangularis (Clerck)	2♂2♀
11	Tegenaria civilis Walckenaer	Tegenaria domestica (Clerck)	1♂ 3♀, 1 juv.
12	Tarentula fabrilis (Clerck)?	Arctosa perita (Latreille) (!)	10
13	Tarentula taeniata (C. L. Koch)?	Alopecosa cuneata (Clerck) (!)	12
14	Lycosa monticola (Clerck)	Pardosa palustris (Linnaeus) (!)	3♂ 1♀, 1 juv.
15	Lycosa paludicola (Clerck)	Pardosa paludicola (Clerck)	2 ♀
16	Lycosa amentata (Clerck)	Pardosa paludicola (Clerck) (!)	1\$
17	Lycosa amentata (Clerck)	Pardosa amentata (Clerck)	10
18	Lycosa amentata (Clerck)	Pardosa amentata (Clerck)	$1 \stackrel{?}{\circlearrowleft} 6 \stackrel{?}{\hookrightarrow}$, 1 juv. (+ unident. lycosid $1 \stackrel{?}{\circlearrowleft}$
			without palps)
19	Lycosa pullata (Clerck)	Pardosa paludicola (Clerck) (!)	1♀
20	Potamia piscatoria (Clerck)	Pirata piscatorius (Clerck)	$1 \circlearrowleft 1 \updownarrow (\updownarrow \text{ without abdomen})$
21	Dolomedes fimbriatus (Clerck)	see text	19
22	Attus striatus (Clerck)	Sitticus pubescens (Fabricius) (!) see text	19
23	Attus terebratus (Clerck)	Sitticus terebratus (Clerck)	3♂
24	Attus falcatus (Clerck) (var. flam- matus)	Evarcha falcata (Clerck)	19
25	Dendryphantes hastatus (Clerck)	Dendryphantes hastatus (Clerck)	1♀
26	<i>Xysticus cristatus</i> (Clerck)	<i>Xysticus cristatus</i> (Clerck)	2
27	Philodromus aureolus (Clerck)	Philodromus cespitum (Walckenaer) (!)	3♀
28	Thanatus formicinus (Clerck)	Thanatus formicinus (Clerck)	1♀
29	Anyphaena accentuata (Walckenaer)	Anyphaena accentuata (Walckenaer)	2 juv.
30	Drassus 4-punctatus (Linnaeus)	Scotophaeus quadripunctatus (Linnaeus)	1♂
31	Segestria senoculata (Linnaeus)	Segestria senoculata (Linnaeus)	1♀
32	Lycosa tarsalis (Thorell)	Pardosa palustris (Linnaeus)	2 ♀

Table 1. List of remaining material in Clerck's spider collection (cf. Holm 1978)

The end of Bonnet's action took place in 1959 when the commission by Direction 104 confirmed "grant of the status of availability to the names published by C. A. Clerck in 1757 in the work Aranei svecici " (ICZN 1959).

The rediscovery of Clerck's collection of insects and spiders

In 1965 my late colleague at the Swedish Museum of Natural History Per Inge Persson happened to read the paper on Clerck's spider collection by Thorell (1858) which reported that the collection was housed in the Bergian school of gardening in Stockholm. With the heavy expansion of the city in the second half of the 19th century the school of gardening had already in 1885 moved to the location of what is now known as the Bergius Botanical Garden, close to the Natural History Museum. Persson's curiosity was awakened and, actually, he found that Clerck's collection was still in the custody of the Bergius Foundation (Persson 1978). The collection was kept in a rococo cabinet with 48 drawers from the middle of the 18th century. One of the drawers stored the remains of Clerck's spider collection. Of the 87 glass tubes with alcohol left by Thorell more than 100 years before, only 34 tubes were in existence when Åke Holm undertook a revision of the remaining spiders (Holm 1978). The tubes were since long dried out so the spiders had to be softened before being put back into alcohol. An account is given here on the material still present in Clerck's spider collection, mainly the same as given in Holm 1978) (Table 1). The material is deposited at the Swedish Museum of Natural History where it is stored in two glass jars (Fig. 7). Clerck's spider collection still has a considerable scientific value. We do not know whether any of the remaining specimens were before Clerck when he made his descriptions. However, when surviving specimens belong to species described by Clerck, they should be treated as syntypes or lectotypes and be considered in revisionary works. Holm

(1978) pointed out that every change in Thorell's identifications of species described by Clerck would cause confusion because Clerckian names had been in use for such a long time.

An exception would be *Araneus striatus* Clerck. Holm (1978) found that the remaining female identified by Thorell in fact is conspecific with *Sitticus pubescens* (Fabricius). In her revision of the genus *Sitticus*, Harm (1973) said that she was going to address the Commission about this case. It seems, though, that she never went through with suppressing *Araneus striatus* Clerck as a senior subjective synonym in favour of the wellknown name *Sitticus pubescens*.

Also *Araneus x-notatus* Clerck seems to be in need of a closer look due to nomenclatural reasons. Thorell (1856) interpreted it as identical with Zilla montana sensu Westring (non C. L. Koch) [= Stroemiellus stroemi (Thorell)] but changed his view when he was able to examine two remaining females in Clerck's collection. He then (Thorell 1858) stated that they belonged to "Zilla calophylla (Walck.) Koch". Holm (1978) found the two females to belong to Zygiella atrica (C. L. Koch), a very common species around Stockholm, and I concur with him after examining them. Current usage should, however, be maintained, because we cannot exclude the possibility that one or more of the specimens which Clerck had might have been of Zygiella xnotata.

Examination of the specimen said to be *Dolomedes fimbriatus* [a female according to Thorell (1858), a male according to Holm (1978)] resulted in a surprise to me. It proved to be a female of some non-Swedish *Dolomedes*-like species. On Thorell's label is written "Ekeberg" which may hint at the sea captain of the Swedish East India Company Carl Gustaf Ekeberg who brought back natural history specimens from his journeys for among others Linnaeus. Thus, neither *D. fimbriatus* nor *D. plantarius* are represented in the remains of Clerck's collection.

Presently 53 spider species carry names given by Clerck (Platnick 2008). Concerning these, there is a division among the arachnologists of today: those who write the author name and year as "Clerck, 1758", according to the Code, and those who are disobedient and write "Clerck, 1757". The latter alternative is used by Norman Platnick in his World Spider Catalog (Platnick 2008). Why can it not be a ruling in the Code to the effect that the officially correct citation should be "Clerck, 1757"?

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