



Carl Linnaeus and his scale insects (Hemiptera: Coccoidea)*

D.J. WILLIAMS

Department of Entomology, The Natural History Museum, London SW7 5BD, UK
djwilliamstriloc@aol.com

*In: Zhang, Z.-Q. & Shear, W.A. (Eds) (2007) Linnaeus Tercentenary: Progress in Invertebrate Taxonomy. *Zootaxa*, 1668, 1–766.

Table of contents

Abstract	428
Introduction	428
Linnaeus' descriptions of scale insects with translations into English	430
History and description of Linnaeus' collection of insects	435
Plant names listed by Linnaeus with their present names	438
Scale insects named by Linnaeus	438
<i>Coccus adonidum</i>	439
<i>Coccus aonidum</i> (Family Diaspididae)	439
<i>Coccus betulae</i> (Family Coccidae)	441
<i>Coccus cacti</i> (Family Monophlebidae)	441
<i>Coccus capensis</i> (Family Conchaspidae)	442
<i>Coccus capreae</i> (Family Coccidae)	443
<i>Coccus carpini</i> (Family Coccidae)	443
<i>Pediculus coffeae</i>	444
<i>Coccus coryli</i> (Family Coccidae)	444
<i>Coccus hesperidum</i> (Family Coccidae)	444
<i>Coccus ilicis</i> (Family Kermesidae)	446
<i>Coccus myricae</i> (Family Coccidae)	448
<i>Coccus oxyacanthae</i> (Family Coccidae)	448
<i>Coccus phalaridis</i>	449
<i>Coccus pilosellae</i> (Family ? Margarodidae)	449
<i>Coccus polonicus</i> (Family Margarodidae) [now known as <i>Porphyrophora polonica</i> (L.)]	450
<i>Coccus quercus</i> (Family Kermesidae)	452
<i>Coccus rusci</i> (Family Coccidae) [now known as <i>Ceroplastes rusci</i> (L.)]	454
<i>Coccus salicis</i> (Family Diaspididae) [now known as <i>Chionaspis salicis</i> (L.)]	456
<i>Coccus tiliae</i> (Family Coccidae) [now known as <i>Eulecanium tiliae</i> (L.)]	458
<i>Coccus ulmi</i> (Family Diaspididae) [now known as <i>Lepidosaphes ulmi</i> (L.)]	459
<i>Aphis urticae</i> (Family Ortheziidae) [now known as <i>Orthezia urticae</i> (L.)]	461
<i>Coccus uvaeursi</i> (Family Eriococcidae) [now known as <i>Eriococcus uvaeursi</i> (L.)]	463
<i>Coccus vitis</i> (Family Coccidae) [now known as <i>Pulvinaria vitis</i> (L.)]	465
Index to the authors of scale insect literature cited by Linnaeus	467
Acknowledgements	485
References	485

Abstract

Carl Linnaeus named 22 species of scale insects in the genus *Coccus*, another in the genus *Aphis*, and one other probably unintentionally. All are redescribed and discussed. It is established that *Coccus betulae* L. is a *nomen nudum* and that the name was validly described later by Fabricius. A brief history of Linnaeus' collection is summarised and his scale insect collection described. Linnaeus' descriptions of scale insects are here translated into English and all the references to scale insect literature cited by Linnaeus are listed in bibliographical form and annotated. Lectotypes are designated for the species names *Coccus aonidum* Linnaeus, *Aphis urticae* Linnaeus and *Coccus uvaeursi* Linnaeus. One species, *Coccus phalaridis*, is here considered *incertae sedis*. *Coccus pilosellae* is recognised as a **syn.nov.** of *Porphyrophora polonica* (L.). *Coccus rusci* is recognised as *Ceroplastes rusci* (L.), not *Columnnea rusci*.

Key words: *Coccus*, *Aphis*, English translations, Scale insect literature cited by Linnaeus

Introduction

Carl Linnaeus (1707–1778) named and described 23 species of scale insects in four major works, which include the 10th and 12th editions of his *Systema Naturae* (Linnaeus, 1758, 1767), his *Fauna Svecica* (Linnaeus, 1761) and his *Centuria Insectorum Rariorum* (Linnaeus, 1763). He also named another species validly but unintentionally (see under *Coccus adonidum*), making a total of 24 species. However, the number of scale insects was small compared with 7700 species of plants and about 4000 species of animals that Linnaeus named in his lifetime (Stearn & Bridson, 1978).

It is not only the naming of the species that made Linnaeus so famous, it was that he consistently named the species as binomens instead of the polynomial method used by many earlier workers. Linnaeus included names under the four categories, Classis, Ordo, Genus and Species. He did not invent the binominal system of naming organisms (Stearn, 1959a). Many of Linnaeus' predecessors had used binominals, as shown in the section below on authors cited. Linnaeus adopted the binominal system in his works on botany in his *Species Plantarum* published in 1753, the starting point of botanical nomenclature, and in his *Systema Naturae* published in 1758, the starting point of zoological nomenclature. The naming of species in two names was not enough, however, to distinguish species and Linnaeus did not abandon the polynomial system because he used it following each binomen and diagnosis and sometimes added a further description. He also added bibliographical references to earlier descriptions and illustrations so that all readers had the same concept of a species. Without the citation of earlier works, many of Linnaeus' names would be *nomina nuda*. Although the *Systema Naturae* of 1758 is the starting point for zoological nomenclature, any earlier works are still of value for their descriptions and illustrations which can be quoted, even those included in the Official List of Rejected Works by the Commission on Zoological Nomenclature. Some scale insect workers may not know that pre-1758 works are not invalid for most of their contents, they are only invalid for their nomenclature or names of species.

Nowadays, once we know a binomen, we can search the literature easily. For any scale insect, for instance, there is a database which includes references for distinguishing characters, the listing of host plants, foes and other topics (Ben-Dov *et al.* 2005).

Much has been written about Linnaeus, and accounts of his life and achievements are available in two major works by Hagberg (1952) and Blunt (1971). There are many useful shorter articles by Dick (1957), Dixon & Brishnamar (2007a), Hemming (1957), James (1957), Malmeström (1960) and Stearn (1958, 1959a). Most authors who have written about Linnaeus have been botanists and were not acquainted with scale insects. There are still accounts being published (such as Blunt, 1971), reiterating how Linnaeus received specimens of the cochineal insect of commerce and that all were accidentally destroyed by his gardener except for one specimen. Scale insect workers have known for over 100 years that these specimens did not represent the cochineal insect but a totally different insect and that Linnaeus never did see the cochineal insect [see Williams & Gertsson (2005)].