

NOTES ABOUT NORTH AMERICAN BUTTERFLIES DESCRIBED
BY LINNAEUS IN THE TENTH EDITION OF
SYSTEMA NATURAE, 1758

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There are in *Systema Naturae* (Ed. X) 18 names of butterflies that today are applied to species found in the United States. Only by tracing the original collectors of the specimens upon which Linnaeus based his names can we determine with some degree of accuracy the meanings of these names. Linnaeus never left Europe. He usually was careful to cite the authority upon which he depended for the authenticity of the animals he included in *Systema Naturae*. Few of the pre-Linnaean writers upon whom he depended had visited and collected in the Americas. Slowly we are learning of the field collectors who supplied the specimens described and figured. In many instances we have concrete evidence that Linnaeus saw or had before him specimens that we would consider today to be the types of his names. In other cases we do not have this assurance.

In the cases of *troilus*, *glaucus*, *polydamas* and *vanillae* the original descriptions are followed with the initials "M. L. U.," *Musei Ludovicae Ulricaе*. These specimens Linnaeus saw at the royal palace of Drottningholm in the collection of the Queen of Sweden, wife of Adolphus Fredericus. After the death of the Queen the collection was neglected and many of the specimens of insects in it were destroyed. In 1803, King Gustaf Adolphus IV presented the remains to the Academy at Upsala, where Linnaeus had been professor. There Thunberg, student of and successor to Linnaeus, listed the material received as "Mus. Gust. Adolph." Fortunately the Swedish artist Karl Clerck painted faithful drawings of 105 species of the butterflies in the Queen's collection. This work was done under the eye of Linnaeus and was published in parts, the first in 1759 and the second in 1764. A third part exists only in manuscript. Clerck's "Icones" was prepared and published by the order of the Queen and never was released to the booksellers of the time. In 1882, P. O. C. Aurivillius published an exhaustive study of the Lepidoptera that had been in the Queen's collection. In this he indicated those names still represented by specimens, and for those the types of which have been lost, he indicated a figure that he considered typical. Unfortunately Aurivillius said nothing about the collectors responsible for the Queen's collection.

For many specimens described by Linnaeus we have following the original description references to older authors and for one particular group of these authors we do have some inkling of the collectors. We also know that Peter Kalm, a student of Linnaeus, journeyed to Pennsylvania, New York and Canada in 1747 collecting plants and some insects (Kalm, 1753). At least some of Kalm's captures were contributed to Her Majesty's collections.

The species that Linnaeus described in 1758 that now are listed from the United States fall into two groups: those that are tropical and enter our southern states and those that are truly North American. The tropical butterflies, *polydamas*, *stelenes*, *sennae*, *vanillae* and *proteus*, were described on the basis of specimens of or drawings published by Madame Merian, and, or, published by Sir Hans Sloane. Madame Merian's material was collected by herself in Surinam during her stay from 1699 to 1702. *Her Metamorphosis Insectorum Surinamensium* . . . (1705) is a sumptuous work, beautifully illustrated with water-colored copper engravings. The butterflies and their preparatory states are fairly well drawn but not accurate in delineation and detail. Many of them can be recognized with no great difficulty, others not. Sir Hans Sloane left England in 1687 for Jamaica in the West Indies where for about fifteen months he served as physician to the governor and spent most of his time studying the natural history of the island. When he arrived home he prepared a two volume work about his travels (Sloane, 1707, 1725). In the second volume he described in detail the butterflies he had collected and illustrated them with copper engravings. I found little difficulty recognizing almost all of the species he enumerated and illustrated.

Perhaps to us the most interesting are the North American butterflies that Linnaeus named in 1758. These are *troilus*, *glaucus*, *ajax*, *antiloachus*, *plexippus*, *antiopa* and *euphrosyne*. Also interesting are some that he did not name at that time but for which there was reasonably good support. One of these is *turnus* which he named in 1771. It is the first species of North American butterfly that was figured. Thomas Mouffet, physician, had the honor of this "first." He published it in his *Insectorum sive Minimorum Animalium Theatrum* . . . (1634). The drawing had been made originally by John White, an artist, who was the governor of the second expedition to Virginia sent out to colonize North America by Sir Walter Raleigh. White made the drawing in July or early August of 1587. Holland published a black-and-white plate of the original drawing used by Mouffet at Plate LXXVII in the 1931 edition of his *Butterfly Book*, and gave a brief account of it pages 304-307.

Linnaeus's sources for his North American butterflies of 1758 were these: John Ray (1628–1705), James Petiver (Ca. 1663–1718), Mark Catesby (1679–1749), George Edwards (1694–1773), Queen Louisa's collection and his own.

These four authors of pre-Linnaean works on natural history form an interestingly knit circle that revolved about the dynamic Sir Hans Sloane. Of the lot, the great gatherer of "natural curiosities," as he called them, was James Petiver. We know of 79 correspondents of Petiver who supplied him with material from the West Indies and the British colonies on North America around 1700. They ranged from Hudson's Bay and the Massachusetts Bay colony to Barbados. Petiver's world-wide list of correspondents must have been many times this length. In fact, he was so busy sending out instructions for collecting and preserving natural history material that he had these printed, "*Brief Directions for the Easie Making and Preserving Collections of all Natural Curiosities for James Petiver Fellow of the Royal Society London.*" These directions have been reprinted as Appendix II of Stearns's fine biographical study of Petiver (1952).

John Ray was the oldest of the coterie. He was born in Black Notley, Essex, 29 November 1628 and died 7 January 1704/05.¹ His *Historia insectorum . . .* was published posthumously in London by Churchill in 1710. We know from letters between Ray and Petiver that the latter supplied the founder of modern natural history with plants from all of the continents but Australia. Doubtless he also contributed some insects. Linnaeus cited Ray ("*Raj. ins.*") as an authority for *Papilio ajax*, *sennae* and *plexippus*. It is quite possible that two of Petiver's correspondents in South Carolina supplied the models for Ray's descriptions. These colonial collectors were Edmund Bohun and Mde. Hannah Williams. It is as yet an unsettled point whether or not Petiver added to Ray's manuscript after Ray's death and before it was published. Martin Lister did add an appendix upon British scarabs. Ray's descriptions are not good in the modern sense, but they are not altogether bad. However, some of them misled Linnaeus as will be developed later.

Next in age is Petiver. He was born at Hillmorton, near Rugby, Warwickshire in 1663 or 1664. By 1685, Petiver was established as an apothecary in Aldersgate Street, London, where he died in 1718. No

¹Dates written thus are Old Style. The year number in England in the Julian Calendar changed on March 25. The second of the two year numbers is the Gregorian year. The day number must be increased by 11 days to change from Julian (Old Style) to Gregorian (New Style) dates during the 18th Century and by 10 days earlier than 1700.

brief synopsis can adequately describe this man. You must read Stearns's account to get the flavor of him. Two of his published works are cited by Linnaeus: *Musei Petiveriani* . . . published in ten parts (1696–1703), and *Gazophylacii naturae* . . . also published in ten parts (1702–1711). In 1758, Linnaeus used for butterflies in which we are interested three references to the *Musei*: with *protesilaus*, *antiloachus* and *plexippus*. For reasons that will be developed later I suspect that at least two of the butterflies involved depend upon the same specimens referred to in Ray's posthumous publication.

Mark Catesby, born 24 March 1682/3 at Castle Hedington, Essex, was the only one of Linnaeus's old authorities for North American butterflies who had collected the specimens himself. His *The Natural History of Carolina, Florida and the Bahama Islands* . . . was published in London by Innys. The first volume appeared in 1731, the second in 1743 and an Appendix was published in 1748. Catesby made two trips to the New World, both of them under auspices that gave him entry to the large landholders. His first voyage began on 23 April 1712. He spent almost seven years in Virginia paying a short visit to the island of Jamaica in 1714 and returning home in the autumn of 1719. He set out on his second voyage in February 1721/22 for Charles Town, South Carolina. He wandered over the seaboard of that colony until early in 1725 when he sailed to the Bahamas where he spent almost a year before returning to England in 1726. His *Natural History* was published in fascicles of 20 plates, each with text. All of Catesby's illustrations of butterflies are in color and are associated with botanical plates. His bird plates were the first to pose the birds in natural positions, a technique later exploited by Audubon who probably had been influenced by Catesby's lovely colored engravings. A full account of Catesby recently has been published (Frick and Stearns, 1961). Although Catesby adequately illustrated numerous butterflies, Linnaeus called attention to his work for only three names: *protesilaus*, *antiloachus* and *plexippus*.

The youngest of the quartette, and least interesting to us, was George Edwards. He was born 3 April 1694 at Stratford in Essex. Although a painter by training, he was librarian of the Royal College of Physicians, through Sloane's appointment. He published *A Natural History of Birds* . . . in four volumes (1743–1751). Incidental to the bird illustrations are some figures of butterflies. Edwards's life carried him into the Linnaean period for he died on 23 July 1773 in Plaistow. Linnaeus's only reference to Edwards of interest to us is found under *Papilio ajax*.

THE NORTH AMERICAN BUTTERFLIES NOTED IN *Systema Naturae*, Ed. X

p. 459: "Troilus. 5. P. E. alis caudatis nigris: primoribus punctis marginalibus pallidis; posticis subtus maculis fulvis. M. L. U. *Habitat in Indiis.*"

Although Linnaeus does not cite any of the pre-Linnaean authors for *troilus*, Petiver (1696-1703:51, no. 523), refers to the species. Unfortunately Clerck did not figure *troilus*. Aurivillius (1882: 12), since he did not find any specimen in the collection of Queen Louisa, designated Cramer's figure (1775-1791, 3: pl. 207, fig. B, C) as *fig. typicae*. We do not know from whom the Queen received her specimen of *troilus*. The fact that Linnaeus stated "*Habitat in Indiis*" is strong evidence that it had not been collected by Peter Kalm who supplied many of the Queen's North American specimens. It may well have been received from one of the Swedish colonists on the lower Delaware River. This would be a reasonable area to suggest for the type locality of *troilus* since it is far enough north of southern Georgia, the type locality of the southern subspecies *ilioneus* Smith. Rothschild and Jordan (1906) did not recognize *ilioneus* as a subspecies of *troilus* but considered the two names to represent the same insect. They did recognize *texana* Ehrmann as a subspecies. It is apparent from the listed localities of the material that they studied (Rothschild & Jordan, 1906: 597) that they had not seen any specimens of *ilioneus* and based their decision upon Abbot's plate (Smith, 1797, I, pl. 2) considering it somewhat exaggerated. Today *texana* is synonymized with *ilioneus*.

p. 460 "Glaucus. 9. P. E. alis subcaudatis nebulosis concoloribus: primoribus macula flava; posticis macula ani fulva. M. L. U. *Habitat in America.*
Alae Posticae Linea *transversa fusca bifida; ceterum Troilo similis.*"

Linnaeus "America" is as vague as it reads. Without reference given to the older authors it appears that Linnaeus felt this species had not previously been known. Clerck's figure (1764, II, pl. 24, fig. 1) fixes the name upon the dark female form of the butterfly later (1771) named *turnus* by Linnaeus. Although Mouffet, Petiver, Ray and Catesby all had figured *turnus*, no mention of these pre-Linnaean authors is associated with its original description. In the *Systema* (Ed. X) Linnaeus referred Petiver's and Catesby's figures to *antiloachus* (see discussion under that name, below). A fitting type locality for *glaucus* is not easily suggested since we do not know from whom Queen Louisa received her specimens. For *turnus* Linnaeus stated "*Habitat in America. D. Fabricius,*" meaning from America in the collection of Fabricius. This suggests strongly that Fabricius had acquired the specimen from one of his English friends while living in England during the late 1760's.

The collector could not have been Abbot, who sailed from the New World in 1773. The Scottish surgeon Hunter had visited Charleston, South Carolina, and had collected butterflies there in the early 1760's and Fabricius had visited with him. Thus it is possible that the type of *turnus* came from the vicinity of Charleston. Linnaeus's descriptions in the animal appendix to his *Mantissa Plantarum* are much better than those in the *Systema* (Ed. X) and there is no question about the determination of *turnus*. Thus between Clerck's figure of *glaucus* and this good description the "species" *glaucus* is well founded, although the species takes its name from the restricted female form.

p. 460 Polydamas. 11. P. E. alis dentatis nigris fascia interrupta flava, posticis subtus rubro notatis. *M. L. U. Merian. sur. 31, t. 31 Habitat in Hibisco mutabili Americis.*

Alae supra fascia lutea e maculis parallelis sagittatis; Posticarum margo subtus maculis 7, linearibus, flexuosis (3), coccineis.

Linnaeus's description and the Merian figure are in conflict. They refer not only to two species but to two different types of *Papilio*. Madame Merian's figure, which includes drawings of the male, female, larva and pupa, clearly represents the species later called *androgeus* by Cramer. To this also may be referred the statement that the "habitat" is "Hibisco mutabili." Sloane figured the Jamaican subspecies of *polydamas* (1725, II: pl. 239, figs. 19, 20), not well, but recognizably. Since Linnaeus was familiar with Sloane's books it is curious that he did not refer to this figure if he meant by *polydamas* what we mean today. Klots's statement (p. 180) that the type locality for *polydamas* is Cuba follows Rothschild and Jordan and is highly questionable. The Cuban form is somewhat different from that found on the mainland and forms a link between the uniform pattern expressed from Mexico southward to Argentina and the great variety of insular subspecies found in the West Indies. A much more reasonable type locality, in the light of history, is Surinam, the source of so much pre-Linnaean Neotropical material. Unfortunately Clerck did not figure this species. If he had, we would at least know if Queen Louisa's specimen was from the mainland or the islands.

p. 462 Ajax. 26. P. E. alis obtuse caudatis concoloribus fuscis: fasciis flaviscentibus, angulo ani fulvo. *Raj. ins. 111. n. 2. Edw. av. 34. Habitat in America boreali.*

Linnaeus's brief description and the two conflicting references have caused this name to be applied to two totally different *Papilio*, the one later called *polyxenes* by Fabricius and the other later called *marcellus* by Cramer. Linnaeus's definition of the name describes a tailed *Papilio* with uniformly dark wings across which are bands of yellowish and

with a fulvous anal spot on the hind wing. Ray's description, the first citation in the original description, appears to represent the yellow form of *glaucus* from Virginia. Ray further referred to Mouffet's *Theatrum*, p. 98, where is figured John White's drawing of the butterfly. This species lacks the "angulo ani fulvo." The Edwards figure is a good representation of *marcellus* Cramer. On it the "angulo ani" is bright red, not fulvous. Since Linnaeus referred other drawings and description of *marcellus* to his *protesilaus*, he may have made the mistake suggested by Rothschild and Jordan (1906: 687), and placed the Edwards's reference with *ajax* in error. Aurivillius (1882: 30, 31) pointed out that Linnaeus's description of *protesilaus* might be applied to several species and that Linnaeus (1764: 209) segregated "Varietas a" for which Aurivillius gave Edwards's figure as the "fig. typica" and included in the synonymy some twenty-two uses of the name *ajax* in this respect. Two of these are Linnaeus's use of *ajax* in *Systema Naturae* Ed. X and Ed. XII, in both cases followed by a query, (?). Later in his account (1882: 178) Aurivillius synonymized *ajax* with *polyxenes* Fabricius, and pointed out that this is the insect represented as *ajax* on Clerck's plate 33, figure 3 in volume II. Since these drawings were made under Linnaeus' supervision, such assignment of the name must have satisfied him. Curiously, Aurivillius here nominated Abbot's figure (in Smith, 1797, I, pl. 1) as "fig. typicae" although Smith erroneously called the butterfly *troilus*. Actually, if any figure was to be so named it should have been Clerck's. With three species represented by the original description of *ajax* (*turnus* Linnaeus, *polyxenes* Fabricius and *marcellus* Cramer) the International Commission on Zoological Nomenclature settled the problem in Opinion 286 (12 October 1954) by declaring the name *ajax* Linnaeus 1758 suppressed for purposes of priority but not for homonymy. Thus this name has disappeared from our checklists except in the synonymy. The involved arguments for this action were set forth clearly by Rothschild and Jordan in 1906 but almost fifty years passed before their action passing over the 1758 name was sanctioned by the Commission.

- p. 463 *Protesilaus* 29. P. E. alis caudatis subconcoloribus albidis: fasciis fuscis: unica subtus sanguinae, angulo ani rubio. *Pet. mus.* 50. n. 502. *Sloan. jam.* 2 p. 218. t. 239. f. 1, 2. *Mer. surin.* 43. t. 43. *Seb. mus.* 1, t. 11. f. 2. *Catesb. car.* 2., t. 100. *Habitat in America septentrionali.*
Simillimus *Podalirio Europae australis & Africae; an satis diversus?*

The insect that now goes under the name *protesilaus* is not found in North America but must be mentioned. The Linnaean description can be applied to any of the white kite-tailed *Papilio*s of the American tropics

(now generally assigned to the genus *Graphium* Scopoli, 1777). None of these enter North America (“America *septentrionali*”). The fact that Linnaeus described the wings as white and was doubtful that the species differed from *podalirius*, which he described in a footnote on page 463, eliminates what now is called *marcellus* Cramer. In this footnote Linnaeus used the differences found in the larvae to support his designation of two species, *podalirius* and *protesilaus*. Of the five pre-Linnaean references cited, Petiver’s refers to *marcellus* Cramer, Sloane’s to *marcellinus* Doubleday, Merian’s to what we now call *protesilaus* Linnaeus, Seba’s to a species of Nymphalid in *Marpesia* Huebner 1818, and Catesby’s to *marcellus*. Of these citations only Merian’s applies to *protesilaus* in the modern sense, and thus Surinam is suggested as the type locality, in spite of Linnaeus’s statement that the butterfly is found in North America. Aurivillius (1882: 29–30) nominated Clerck’s figure (1764, II, pl. 27, f. 2) as “fig. typica.” since he could not find a specimen in the Queen’s collection. This figure is the basis for our current application of the name *protesilaus* and coincides with Linnaeus’s *protesilaus* of 1764. Rothschild and Jordan (1906: 713) point out that there is preserved in the Linnaean collection at the Linnaean Society of London a specimen without abdomen that “agrees fairly well with Clerck’s figure.” This specimen should be considered the type of the name *protesilaus* Linnaeus 1758, although it was not until 1764 that Linnaeus published a description that adequately defined the name.

- p. 463 *Antilochus*. 28. P. E. alis caudatis concoloribus flavis: fasciis margineque nigris, caudis albis longitudine alae. *Pet. mus.* 50. n. 505. *Papilio* caudatus maximus, striis umbrisque nigris. *Catesb. carol.* 2. t. 83. *Habitat in America septentrionali*.

This is the name that should be applied to the yellow form of *glaucus*! It has been relegated to synonymy because Linnaeus was misled by Petiver and in the original description said “caudis albis longitudine alae” thus mixing a not too bad description of the wings of the yellow form of *glaucus* with a less accurate description of the tails of *marcellus*. Catesby’s figure that is cited is recognizably a male *glaucus*, or the *turnus* form of the female, with extraordinary tails. As late as 1836 *antilochus* was accepted as a good species from North America. Then Boisduval (1836: 340) wrote “. . . aussi nous sommes portés à croire que cet *Antilochus* pourrait bien être un *Turnus* dont les queues auraient été artificielles.”, thus suggesting that *antilochus* is an artificial species. Aurivillius (1882: 28) called *antilochus* “Species fictitia” believing Linnaeus misled by Catesby. In his *Museum Ludovicae Ulricaе*, (1764: 207), Linnaeus stated that the specimen was collected by Peter Kalm

in North America. Aurivillius could find only male *glaucus* in the Queen's collection.

- p. 471 Plexippus 80. P. D. alis integerrimis fulvis: venis nigris dilatatis, margine nigro punctis albis. *Pet. mus.* 58. n. 527. *Sloan. jam.* 2. p. 214, t. 239, f. 5, 6. *Catesb. car.* 2. t. 88. *Raj. ins.* 138. n. 3. *Habitat in America septentrionali.*
Alae primores fascia alba, ut in sequente, cui similis.

The confusion about *plexippus* has been caused by the line added as an appendix to the description. The species that follows *plexippus* is *chrysippus* of which Linnaeus said "*Habitat in Aegypto, America.*" and described "P. D. alis integerrimis fulvis margine nigro punctis albis, posticis disco punctis nigris." *Danaus chrysippus* vaguely resembles *gilippus* Cramer with three largish black spots on the disc of the hind wings, which wings are much yellower than on *gilippus*, and with a rather broad, white, subapical transverse bar on the fore wings. The "fascia alba" is not mentioned in the original description of either *plexippus* or *chrysippus*. It is appended to that of *plexippus* and there also directed to *chrysippus*. In the case of *plexippus*, Linnaeus obviously described the North American "Monarch" and referred consistently to it. Then, apparently he saw either what was later called *megalippe* by Huebner from the American tropics, or *genutia* Cramer from the Orient, possibly both. Considering all of these the same species, he had to add the "fascia alba." Similarly he appears to first have described *gilippus*, and then included the "fascia alba" statement to *plexippus* in such a way that his description of *chrysippus* unsatisfactorily covered both *gilippus* and *chrysippus*. The only representative of the *plexippus-genutia* confusion to be found in Linnaeus's own collection is *genutia* labeled *plexippus*. But, we do not know if this was so in Linnaeus's day. A librarian who had charge of the collection after it had been acquired by the Linnean Society of London added specimens and is suspected of having shifted labels. Thus the question cannot be settled by reference to Linnean specimens. Aurivillius (1882: 70) quoting from Linnaeus's notes made when Linnaeus first studied the Queen's collection in 1751 shows that the basis for the 1758 description in the *Systema* was material collected by Peter Kalm in North America (probably Pennsylvania.) He further argued that the emendation made in the *Systema* fixes the name upon the Oriental species. The resultant confusion about the proper application of the name *plexippus* was settled by action of the International Commission on Zoological Nomenclature in Opinion 282 (1 October 1954). There the name is defined by a neotype, the model of Clark's 1941, pl. 71, fig. 1, a male "Monarch," with the type locality fixed as Pennsylvania. This reverts to Linnaeus's original

use of the name *plexippus*. Mr. N. D. Riley, emeritus Keeper of Lepidoptera, British Museum (N.H.), has written me that the Petiver specimen, collected around 1700, is preserved in the museum. It is the North American Monarch. We both wish that it had been designated the type since it is referred to by Linnaeus in the original description.

pp. 476–7 *Antiopa*. 112. P. N. alis angulatis nigris limbo albido. [six pre-Linnaean references to the insect in Europe are omitted here.] *Habitat in Betula, Salice, etiam in Americae. Kalm.*

There is no question that Linnaeus here is referring to the Mourning Cloak, or Camberwell Beauty. It is interesting that Peter Kalm brought back to Sweden specimens of *antiopa* and that these were used, in part, as the basis of the original description. The type locality for *antiopa* is generally considered to be Upsala, Sweden, where Linnaeus was at work upon his systems of classification. Interestingly, there was no *antiopa* in the Queen's collection. It probably was too plebian to be included!

p. 481 *Euphrosyne*. 142. P. N. alis dentatis fulvis nigro-maculatis: subtus maculis IX argenteis. *Fn. suec.* 782 *Princeps. Pet. mus.* 35. n. 382. *Raj. ins.* 120. n. 7. *Habitat in Europa & America septentrionali. Alae maculis argenteis: posticarum 9: harum 1 disci, 1 baseos.*

The meaning of this name is set by Linnaeus's inclusion of what he had called *Princeps* in his "pre-Linnaean" *Fauna Suecica*, published in 1746. The type locality for *euphrosyne* is Upsala, according to Langer (1957: 200). No subspecies of *euphrosyne* is found in North America. To what did Linnaeus refer when he included "*America septentrionali*" in the distribution of the species? By the time that Linnaeus wrote the 10th edition of the *Systema* he had seen the material brought back by Peter Kalm. This had been collected within the range of *Boloria selene* subspecies and of *Boloria bellona* Fabricius.² Of these only *selene myrina* Cramer or *selene atrocotalis* Huard can be considered. The fact that Linnaeus did not include *euphrosyne* in his 1764 book upon the Queen's collection suggests that Kalm may not have collected the material referred to as North American. However, there is a reference to *Papilio euphrosyne* in Kalm's "Travels" (vol. 1, p. 264, Dover Edition, 1966). Under the date March 24, 1749, he noted seeing the species on a walk near Raccoon (now Swedesboro, Gloucester Co.), New Jersey, where he then was living. Petiver's insect may have been the European species or it may have been collected by Hezekiah Usher of the Massachusetts Bay Colony in 1696. If the latter, then Petiver's reference would apply to *selene myrina*. Ray's description may have been based upon Petiver's

² This name must be restored in place of *toddi* Holland. Opinion 517 of ICZN gives Fabricius 1775 priority over Cramer [1775].

material. The under hind wing of *euphrosyne* from Scandinavia bears nine silvered spots and across the disc and at the base some additional white ones. On *selene* and its allies some of the white spots seen on *euphrosyne* tend toward silvering and there are additional white spots in the limbal zone near the costa. The two probably are close enough in appearance so that Linnaeus was not bothered by the slight differences when he grouped the two together. The fact that he never recognized *selene*, although that species is not uncommon in Scandinavia, tends to support his use of *euphrosyne* for both species.

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