

Pehr Kalm and his observation of North American *Nymphalis antiopa* (L.)
(1749)

with notes and discussion of LINNAEUS specimens, KALM, and characters

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KALM, PEHR [baptized PETTER], (b. March 6, 1716 – d. November 16, 1779) was a Swedish-Finnish explorer, botanist, naturalist, and agricultural economist. One of the LINNAEUS' earliest students, PEHR KALM travelled in Sweden, Finland, Russia, Ukraine and North America (1747-1751). KALM was sent by LINNAEUS to explore North America for new or useful plants.

Most of KALM's time during summers in North America was spent in Canada, from Niagara Falls to Quebec. He spent winters in New England, and spent much of his time travelling overland between the two areas. Upon return home, KALM published his travel diaries in Swedish in 3 volumes, entitled *En Resa til Norra America*. In volume 3, published in 1761, on page 54, KALM mentions *Papilio antiopa* as the first butterfly observed that year in New Jersey. He writes: March 24, 1749, "*Papilio antiopa* flög omkring uti skogsbackarna, och var den första *Papilio* jag såg detta år." Translated from Swedish by Sören Nylin, (2010, pers. com.) "*Papilio antiopa* was flying around in the forested hillsides and was the first *Papilio* that I saw this year". [Translator's note: the word 'skogsbacke' means a hillside in the forest or a wooded slope.]

P. KALM is cited by LINNAEUS in *Species Plantarum* (1753) in 90 instances. In 1758, LINNAEUS in his *Systema Naturae* (10th edition) in the original description for *Papilio antiopa*, wrote: "Habitat *Betula*, *Salice*, etiam en Americæ. Kalm. [translated "Habitat *Betula*, *Salice*, also in America. Kalm." For the actual style of this reference to 'Kalm,' see the facsimile of this work appended at the end. The reference to 'Kalm' lacks a date or anything indicating that it was a publication. In contrast all of the other references listed by LINNAEUS in the description of *antiopa* appear to be publications. In his work, LINNAEUS referred to about 400 different older zoological works, in the form of abbreviations (often cryptic). Thus, the reference to Kalm could be interpreted as 'Kalm (pers. comm.)'. This means that LINNAEUS's reference to *antiopa* occurring in North America is based on KALM's recollection of a **sighting** of *antiopa* in New Jersey in 1749. The sighting was later described by KALM in 1761, in volume 3, as noted above. There is no evidence for LINNAEUS of having in his possession or seeing himself any North American specimens of *Nymphalis antiopa*.

SWEDEN as the Type-locality of *N. antiopa* was inferred by several subsequent authors. VERITY & QUERCI (1923-24) under the entry *Euvanessa antiopa* list Sweden as the Type-locality. This is contradictory to VERITY's earlier assertions (1913, 1916) that the name *antiopa* is based on a N. American specimen. VERITY (1913) states: "It is very likely that the typical specimen is of American origin, being small and having a narrow marginal band. LINNAEUS quotes America as well as Europe, showing he had received it from the New World". VERITY (1916) states: "The specimen left to us by LINNAEUS is, like the preceding, of a rather unusual form: small, with a narrow marginal band. It is very likely of American origin, as LINNAEUS quotes America as the habitat of this species, as well as Europe, showing that he had received it from that country." In 1950, VERITY in his multi-volume work: *Le farfalle diurne d'Italia* specifically restricted the type-locality to Sweden. PELHAM (2008) mentions Sweden as Type-locality of *N. antiopa* based on a reference to

Fauna Suecica. Even that the name *antiopa* does not appear in the first edition of this work, instead LINNAEUS used name *Papilio morio* there. This work was published in 1746, and as such, it is not available for the purposes of zoological nomenclature. However, the merit of this approach is built upon the fact that LINNAEUS named the same creature that he described in *Fauna Suecica* and, that work had a broad type locality in its title: Sweden. — The lectotype is probably Swedish. LINNAEUS lived in Sweden. LINNAEUS was a naturalist. It is a common butterfly. It looks like a European specimen [PELHAM, 2013 (pers. com)].

Type-material: A lectotype has been designated by HONEY & SCOBLE (2001: 297); The specimen is deposited in the collection of the Linnean Society in London, England (LSUK). As such, this lectotype has been apparently validly designated. It also potentially provides an explanation for the reference by LINNAEUS to "etiam in Americae", even though there is no evidence for any specimens coming from North America. In my opinion, the specimen designated by HONEY & SCOBLE (2001: 297), as the lectotype is phenotypically a European specimen. It can reasonably be considered as Swedish.

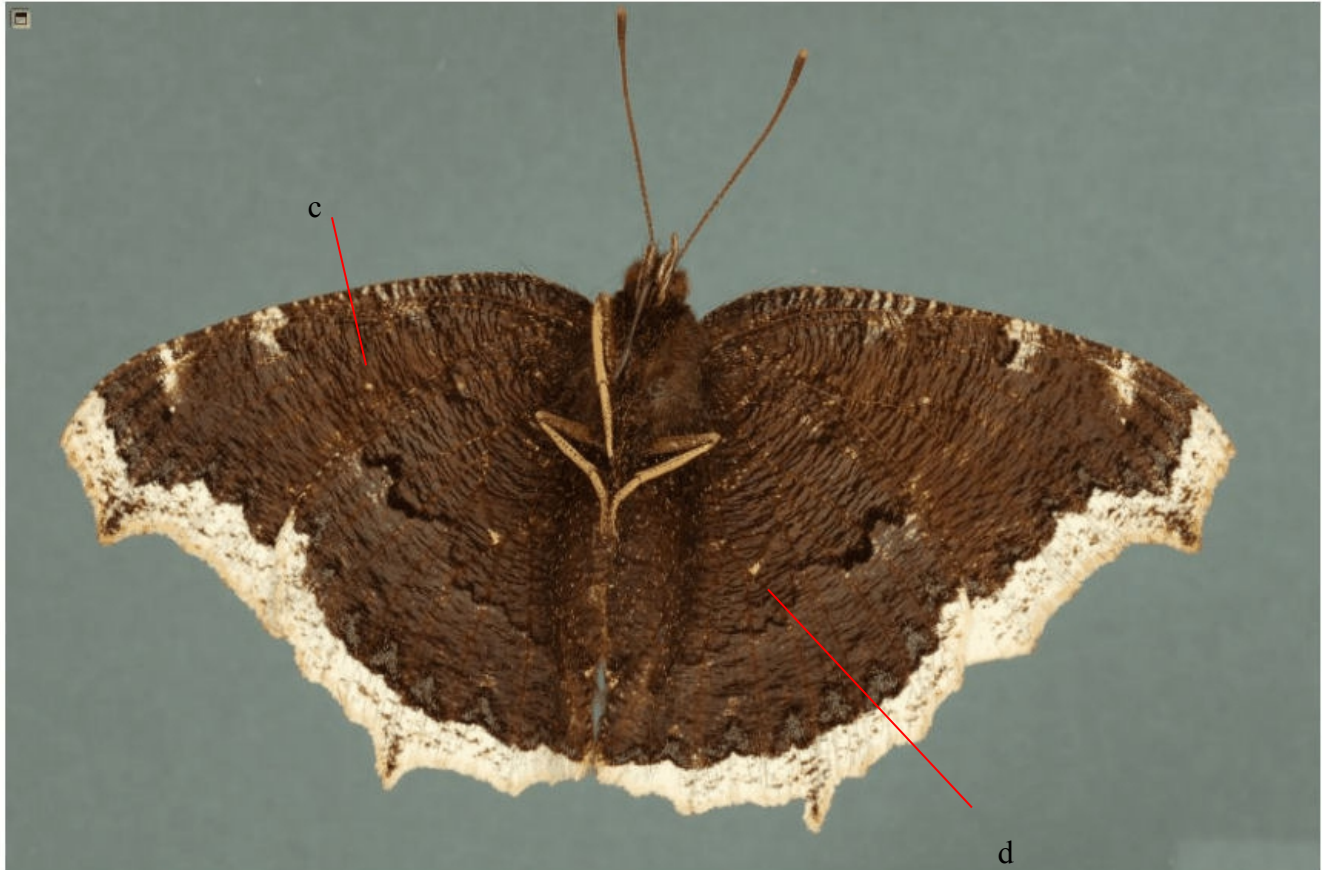
The Mourning cloak, *Nymphalis antiopa* (LINNAEUS, 1758), is a large (wingspan 56-101 mm), distinctive butterfly and it is one of the most widely distributed butterfly species in northern hemisphere. It is also a butterfly with the longest life span. Documented cases show that butterflies of this species can live up to 11 months. There is a German website, hosted by Ingo Daniels, that is specifically devoted to *Nymphalis antiopa*, see <http://www.trauermantel.de/>.



These photographs were copied from the Linnean website, <http://www.linnean-online.org/14604/>, showing the lectotype specimen in the collection of the Linnean Society in London

(LSUK).

Dorsal view. Note the pale yellow marginal band, relatively free of dark scales (peppering, mottling), red line 'a'. Compare this with the last photo, showing extensive peppering in the pale marginal band on the North American specimen. The submarginal row of blue spots is prominent on both wings. The hue of the blue spots as well as the dorsal maroon ground color is very faded in this picture. In fresh specimens, the dark ground color is rich, dark brown, almost black. For comparison, see the last photo. The two pale costal (b) spots are relatively broad. This is typical of European specimens, compare this feature with much narrower pale coastal spots in the North American specimen, shown on the last photo.



Ventral view. Red lines (c, d) point to a signature feature of all Anglewing butterflies. In case of *N. antiopa*, these so called 'comma' markings are very small, reduced to a few pale scales. Note the cryptic-camouflage, color and patterning on ventral surface of both wings. The resemblance to bark, dried leaves or soil is stunning. With wings closed, the butterfly conceals itself from predators by blending in with the substrate on which it rests. This represents a synapomorphic character which is shared among all members of Anglewing butterflies. The concealment gives the Anglewing butterflies tremendous advantage during winter diapause, when the butterflies are hibernating, hidden in various shelters, near or on the ground.

The pale yellow marginal band and the ground cryptic camouflage (brown color) is very faded in this photographs. Particularly, the overwintered specimens have the pale band very pale, almost

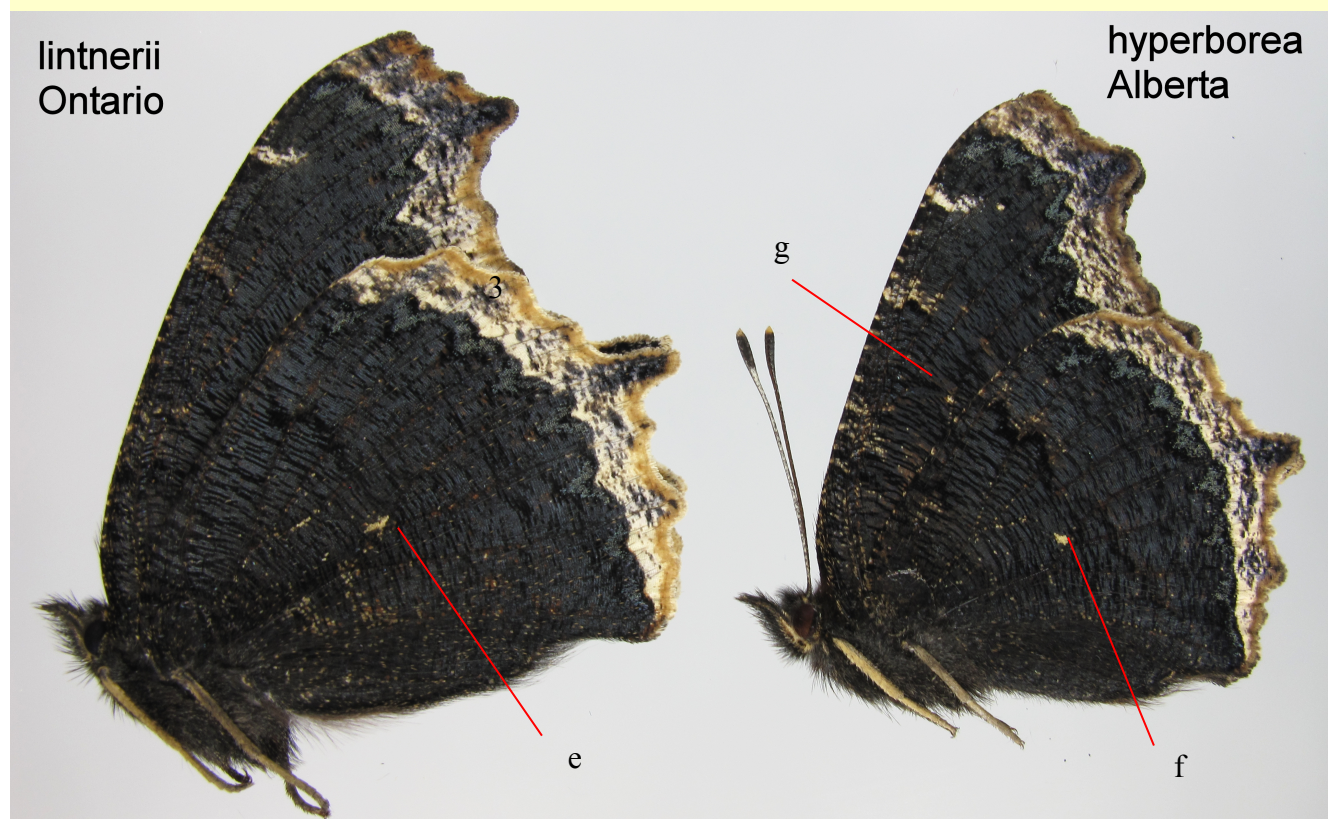
white, rather than yellowish. Compare color in this picture with the color of fresh, i. e. non hibernated specimens shown on the next photo. The fading of color with the age of specimen is patently obvious in these examples. However, it should be noted that the perception of color is highly variable among different observers. Some people are to a various degree 'color blind'. The reproduced color of images (photographs) is dependent on the type of imaging equipment (both the camera and a viewing device), and to a large extent the color depends on the absolute temperature of the light source.

LECTOTYPE LABELS: (1) A Circular disk with blue border with the word LECTO-TYPE. (2) A Small rectangular label, inscribed '112. *Antiopa*'. This refers to 'no. 112 *Antiopa*' in the 10th

Edition of the *Systema Naturae* (1758). (3) A Large, almost square label, inscribed '*Antiopa* 776' – HONEY & SCOBLE (2001) concluded that this label was placed on the specimen at some later date. All labels are inscribed on paper.

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Photo © Norbert Kondla (2010), showing the ventral side of two North American specimens.



Note the difference in the amount of peppering, mottling in the marginal band, when compared with the previous photograph. It shows faded band with lighter peppering, mottling, which is typical of the European specimen. Red lines (e, f, g) points to a very reduced 'comma' marks. Nonetheless, they are tiny, but are present. These characteristic, i.e. signature 'comma' marks are present in all Anglewing butterflies. So is the cryptic-camouflage, color and patterning on the ventral side of both wings. These 'comma' marking are most prominent in *Polygonia gigantea*.



Polygonia gigantea. — Note the prominent 'comma' marking on both wings & cryptic marbling pattern and coloration. This specimen is from China. Photo: © Joseph Belicek (2013).



Nymphalis antiopa — specimen from Czech Republic. Reproduced from the internet. Particularly note the much broader, pale yellow marks near the apex and the pale marginal band without peppering, mottling, as seen on the North American specimen (photograph below).



Nymphalis antiopa — May 20, 2009, photo taken in Johnston County, North Carolina, Howell Woods, USA © Patrick Coin. Reproduced here from *Flicker* on the Internet. Showing an excellent photograph composition and true color fidelity.

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Lugduni Batavorum. 411pp. [In Latin]

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ACAD. UPSAL. HOLMENS. PETROPOL. BEROL. IMPER.
LOND. MONSPEL. TOLOS. FLORENT. SOC.

SYSTEMA NATURÆ

PER
REGNA TRIA NATURÆ,
SECUNDUM
CLASSES, ORDINES,
GENERA, SPECIES,
CUM
CHARACTERIBUS, DIFFERENTIIS.
SYNONYMIS, LOCIS.

TOMUS I.

¹⁰
EDITIO DECIMA, REFORMATA.

Cum Privilegio S:æ R:æ M:tis Sveciæ.

HOLMIÆ,

IMPENSIS DIRECT. LAURENTII SALVII,

1758.

Jonst. inf. t. 9. ♂ 11. Wilk. pap. 58. t. 2. a. 10.
Raj. inf. 135, 136. Ræf. inf. 1. p. 1. t. 1.
De Geer. inf. 1. t. 21. f. 8, 9.
Habitat in Betula, Salice, etiam in America. Kolm.

poly- 113. P. N. alis angulatis fulvis nigro maculatis: primori-
 chloros. bus supra punctis quatuor nigris. *Fn. suec. 773.*
Aldr. inf. 246. f. 7. Merian. eur. 2. t. 2.
Gæd. inf. 1. t. 77. Alb. inf. t. 55.
List. gæd. 5. f. 3. Frisch inf. 6. t. 3.
Pet. mus. 34. n. 315. Reaum. inf. 1. t. 23. f. 2.
Raj. inf. 118. n. 2. Ræf. inf. 1. pap. 1. t. 2.
Wilk. pap. 56. t. 3. a. 5.
Habitat in Pyro, Cerafo, Salice.

Urticæ. 114. P. N. alis angulatis fulvis nigro-maculatis: primo-
 ribus supra punctis tribus nigris. *Fn. suec. 774.*
Mouff. inf. 101. f. 5, 6. Bradl. nat. t. 27. f. 2.
Gæd. inf. 1. t. 21. Merian. eur. 1. t. 44.
List. gæd. 3. f. 2. Alb. inf. t. 4. 51.
Blank. inf. 13. t. 1. f. L-Q. Swamm. bibl. t. 35. f. 12.
Raj. inf. 117. n. 1. Reaum. inf. 1. t. 26. f. 6, 7.
Robert. icon. t. 5. Ræf. inf. 1. pap. 1. t. 4.
Hoffn. pict. 2. f. 16. Wilk. pap. 56. t. 3. a. 3 fig. inf.
Habitat in Urtica vulgarissimus.

C.album. 115. P. N. alis angulatis fulvis nigro-maculatis; posticis
 subtus C albo notatis. *Fn. suec. 775.*
Mouff. inf. 103. f. 2. Frisch. inf. 4. t. 4.
Aldr. inf. t. 244. f. 3, 4. Reaum. inf. 1. t. 27. f. 9, 10.
Raj. inf. 118. n. 3. De Geer. inf. 1. t. 20 f. 9, 10.
Rob. icon. t. 23. Ræf. inf. 1. pap. 1. t. 5.
Merian. eur. 1. t. 14. f. 159. Wilk. pap. 57. t. 3. a. 6.
Alb. inf. t. 4. f. 5.
Habitat in Grossularia, Humulo, Urtica.

C. au- 116. P. N. alis angulatis fulvis nigro-maculatis; posticis
 reum. subtus C aureo notatis.
Habitat in Asia.
Simillimus Pap. C albo, sed duplo major, subtus magis
luteo-nebulosus ♂ C aureo minori notatus.

Dorca. 117. P. N. alis angulatis fuscis, primoribus fascia flava:
 subtus nigro undulatis. *M. L. U.*
Habitat in Calidis regionibus.

118. P. N.