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REVISION OF THE NORTH AMERICAN ERICACIAE-FEEDING *COLIAS* SPECIES, (PIERIDAE: COLIADINAE)¹

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This is the last of the species-group papers in my series of revisionary papers on the genus *Colias* which have been appearing in the Bulletin of the Allyn Museum. The final paper in the series will contain updated information, keys to the species, cladistic analysis, and a comprehensive bibliography.

INTRODUCTION

Four species comprise the North American *Colias* group whose larvae feed upon Ericaceous plants, primarily *Vaccinium* species. These butterflies are widely distributed in boreal forest and alpine habitats situated north of the 35th latitude. As is the case in the *Salix*-feeding *Colias*, in this group also the dorsal wing surfaces do not reflect UV light. In three of the species, the ground color of the wings is yellow in the males, and yellow or white in the females. In the fourth species, *behri* W. H. Edwards, the adults are greenish-yellow. Wing-color dimorphism is the rule in the females, but to a varying degree depending upon the species. Color data are presented in Table 1.

The arrangement of species in this paper should not be interpreted as phylogenetic. As subsequently discussed, *C. interior* Scudder and *C. pelidne* Boisduval and Le Conte appear to be closely related. *C. behri* may be a relict sister species of *C. palaeno* (Linnaeus). Nomenclature in this group has been misinterpreted by various authors, probably as a consequence of the similar appearance of the three yellow species, and inadequate original descriptions of the associated taxa.

In keeping with the I.C.Z.N. Code [Arts. 31a (ii), 32c (i)] regarding the endings *-i*, *-ii*, the spelling has been modified from the original since the use of *-ii* for modern personal names contravenes Arts. 27-31. The designation "Var." appears in much of the early literature and is treated herein as synonymous with subspecies.

Unless noted to the contrary, all specimens illustrated are from the author's collection.

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Table 1. Coloration in Females of the Heath-Feeding *Colias*¹

SPECIES:	N _{TOT}	Yellow	Intermediate	White
<i>interior</i>	509	449; 88.2%	32; 6.3%	28; 5.5%
(western) ²	(116)	(111; 95.7%)	(0; 0%)	(5; 4.3%)
<i>p. pelidne</i> ²	186	0; 0%	8; 4.3%	178; 95.7%
<i>p. skinneri</i>	78	20; 25.6%	7; 9%	51; 65.4%
	(188)	(37; 19.7%)	(0; 0%)	(151; 80.3%)
Valley Co.	23	22; 95.7%	0; 0%	1; 4.3%
<i>p. skinneri</i> (total) ³	101	42; 41.6%	7; 6.9%	52; 51.5%
<i>palaeno baffinensis</i>	61	9; 13%	5; 8%	47; 77%
<i>palaeno chippewa</i>	491	75; 15.7%	33; 6.7%	381; 77.6%
	(241)	(31; 12.9%)	(0; 0%)	(210; 87.1%)
<i>behri</i>	(79)	(27; 34.2%)	(0; 0%)	(52; 65.8%)

NOTES: 1. Data in () are from Hovanitz, 1951.

2. Hovanitz (1951) did not separate eastern *interior* from *pelidne*.

3. Total of *p. skinneri* and Valley Co., ID population.

Colias interior Scudder 1862

Figs. 1-3, holotype

Colias interior Scudder, 1862. Proc. Boston Soc. Nat. Hist., 9:108. TL — "Northern shore of Lake Superior (Prof. Agassiz); mouth of the Saskatchewan River, British America. (S. H. Scudder.)". HT in MCZ, type no. 5081. Based upon the specimen label, the TL is hereby fixed as: Mouth of the Saskatchewan River, vic. Grand Rapids, W. shore of Lake Winnipeg, Manitoba.

- = *Eurymus philodice laurentina* Scudder, 1875:190.
- = *Colias philodice laurentina* Scudder [sic]; Strecker, 1872-1900:133.
- = *Colias interior interior* Scudder; Skinner, 1898:70.
- = *Colias interior* syn. *laurentina* Scudder [sic]; Skinner, 1898:70.
- = *Colias pelidne interior* Scudder; Strecker, 1878:81.
- = *Colias pelidne interior* syn. *Colias philodice laurentina* Scudder [sic]; Strecker, 1878:81.
- = *Eurymus interior* (Scudder); Dyar, 1902:10.
- = *Eurymus interior* syn. *laurentina* Scudder; Dyar, 1902:10.
- = *Eurymus interior interior* (Scudder); Barnes and Benjamin, 1926a:8.
- = *Eurymus interior laurentina* Scudder; Barnes and Benjamin, 1926a:8.
- = *Colias interior* Scudder; Holland, 1931; 1949:294.
- = *Colias interior interior* Scudder; McDunnough, 1938:8.
- = *Colias interior laurentina* Scudder [sic]; McDunnough, 1938:8.
- = *Colias interior vividior* Berger, 1945:42.
- = *Colias interior* Scudder; Jones, 1951:4.
- = *Colias pelidne interior* Scudder; McHenry, 1963:210; 217.
- = *Colias pelidne laurentina* (Scudder); McHenry, 1963:210; 217.
- = *Colias interior interior* Scudder; dos Passos, 1964:42.
- = *Colias interior laurentina* (Scudder); dos Passos, 1964:43.
- = *Colias interior vividior* Berger; dos Passos, 1964:43 (emendation).
- = *Colias interior interior* Scudder; Miller and Brown, 1981:83.
- = *Colias interior laurentina* (Scudder); Miller and Brown, 1981:83.
- = *Colias interior vividior* Berger; Miller and Brown, 1981:83.

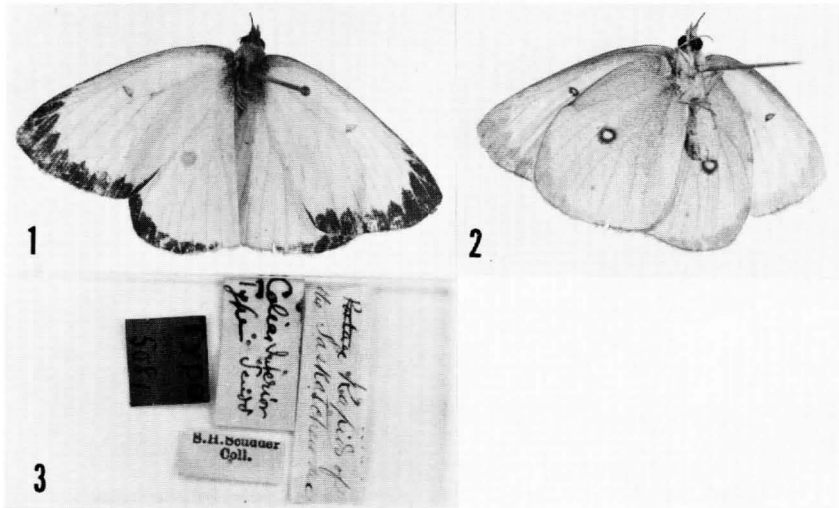
Infrasubspecific Names

Colias interior ♀ f. "nepi" Barnes and Benjamin, 1926b:89, TL — Nepigon [sic], Ontario. HT in NMNH. This name applies to the white or "alba" female form.

Discussion

Although historically three subspecific epithets have been applied to this species, I choose not to recognize any subspecies. *C. interior* is a somewhat variable, widely-distributed butterfly. It varies in phenotype principally in three aspects: 1. Size of adults. 2. Width of DFW black border in the males. 3. D wing color of the females — yellow, creamy-white, or white. The male holotype is shown in Figs. 1-3. Other specimens are shown in Figs. 4-21, and illustrate the range of variability in this species. Adults from the Great Lakes regions of Michigan, Minnesota, and Wisconsin, and the mountains of Virginia and West Virginia tend to be larger and more brightly colored than specimens from elsewhere in the range of this species. This difference is insufficient to merit the subspecific recognition accorded by Berger in the name *vividior*. Masters (*in* Kuehn and Masters, 1972) has suggested that this name may either apply to a hybrid *philodice* x *interior*, or to *C. gigantea* Strecker. Since the latter species has not been recorded from Wisconsin, the second alternative is very doubtful, and the first alternative is unlikely. Masters has confused *interior* with *gigantea* in another publication (1969). The specimen from Minnesota that he illustrated is clearly *interior*. An extreme example of *interior* with regard to the width of the DFW borders is shown in Figs. 20-21. Specimens of this nature are not infrequent from the southern border of the Great Lakes, and these phenotypes may possibly represent hybridization with *philodice* or *eurytheme*. Hybridization between *interior* and *eurytheme* has been discussed by Ae, 1956; 1959.

The females of this species are weakly polymorphic. Over most of its geographic range, the females of *interior* are dorsally yellow with variable dark marginal dusting. Some colonies, however, produce high percentages of white females and specimens of intermediate color. This is especially true in the vicinity of Tabusintac, New Brunswick

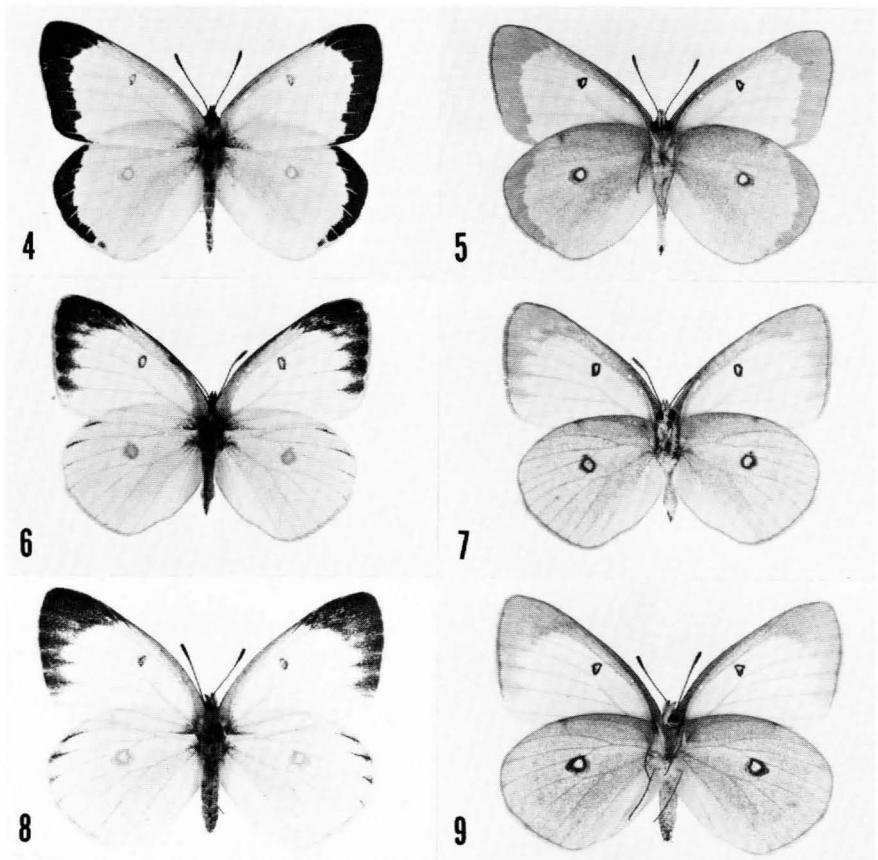


Figures 1-3, Male holotype of *Colias interior*. Dorsal (1). Ventral (2). Specimen labels (3). Specimen in MCZ.

and in the Craig Mtns., Nez Perce Co., Idaho. Other localities from which white females have been recorded include: Passadumkeag, Penobscot Co., ME; Baddeck (Cape Breton Is.), Nova Scotia; Manyberries, Alberta; Cypress Hills, Alberta; Missoula Co., MT; Boundary Co., ID. A bilateral gynandromorph (Fig. 22) was collected by R. A. Layberry in Ottawa, Ontario on 28.vi.78. The left side is the typical male phenotype, and the right side is the intermediate yellowish-white female phenotype. Table 1 presents wing-color data for females of the four species discussed herein.

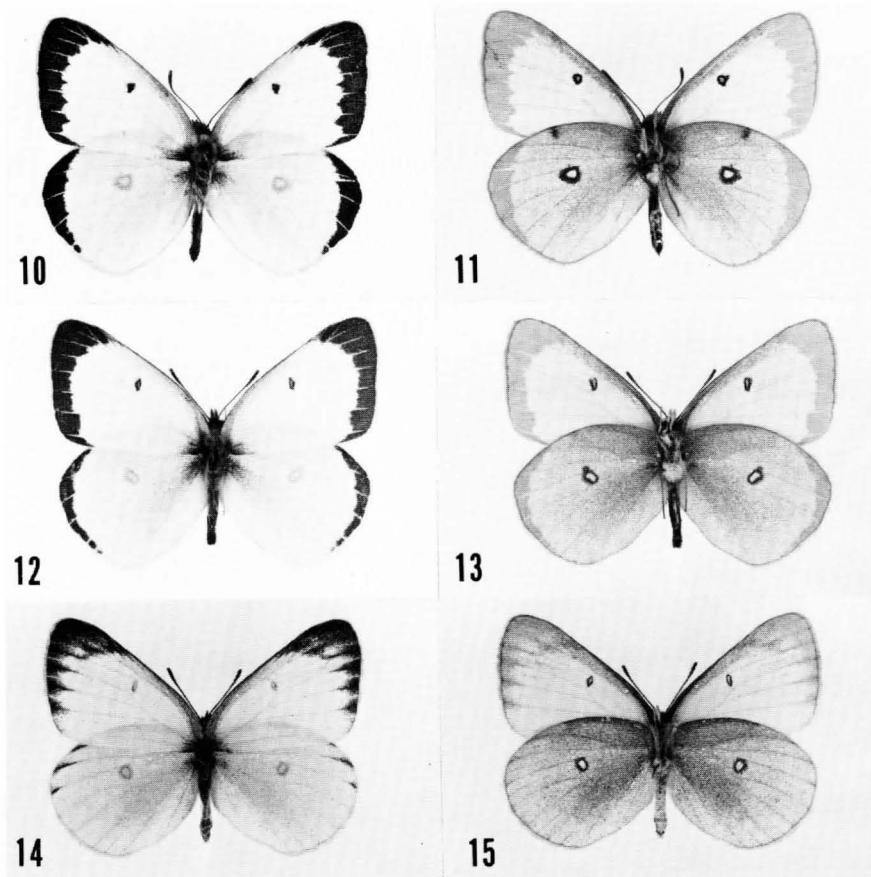
Various species of *Vaccinium* have been reported as larval hosts for this butterfly (Klots, 1951; Ae, 1958; Opler and Krizek, 1984). The species is univoltine. There are conflicting reports concerning the larval instar during which hibernation occurs. Klots (1951:186) states first instar, while Ae (1958:87) states third instar based upon his rearing studies.

The subspecific name *laurentina* Scudder, 1876 is clouded. Scudder described this taxon as a varietal form of *Eurymus philodice* Godart, based upon material from Cape Breton Island. His narrative leads one to believe that this is the same insect that he described as *Colias interior* in 1862. It was Skinner who in 1898 finally placed *laurentina* as a



Figures 4-9. Typical specimens of *C. interior* from eastern N.A. ♂ D (4), Passadumkeag, Penobscot Co., ME, 5.vii.68; same V (5); yellow ♀ D (6), same data; same V (7); "alba" ♀ D (8), Wawa, Ontario, 6.viii.71; same V (9).

synonym of *interior*; Strecker (1878) having placed it as a subspecies of *pelidne*. There is an additional problem. When I examined the Scudder type material sent to me on loan from the MCZ, the type of *C. interior* was clearly identifiable. The tray containing the type series of *C. pelidne labradorensis* (3 males and a female clearly identified by their pin labels), however, contained the cryptic label shown in Fig. 23. The label is in Scudder's handwriting (*vide* F.M. Brown) and reads: "*C. palaeno laurentina / trans ad [transitional to] pelidne / (labradorensis Scud)*". It appears that Scudder was confused about his own name *laurentina*, which on occasion he associated with *philodice*, *pelidne*, and *palaeno*. It is also possible that this label was incorrectly placed by some subsequent curator. I have not been able to locate a type specimen of *laurentina*, and perhaps Scudder did not designate one. His description is somewhat vague. He stated: "The gynandromorphic female of *E. philodice*, whether Cape Breton or of New England, finds, however, no parallel in Labrador, and the Cape Breton male agrees only with the *Philodice*-type. It should be added in this connection that the butterfly collected by Prof. Hamlin at Waterville,



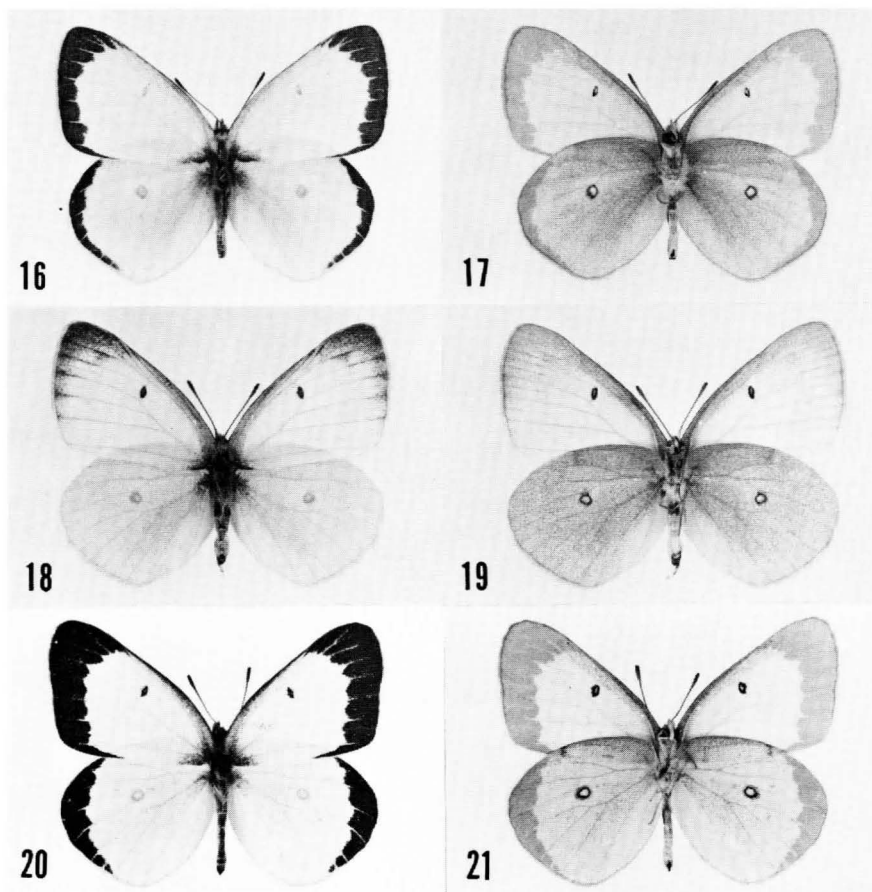
Figures 10-15. Typical specimens of *C. interior* from western N.A. ♂ D (10), Hills E. of Hailstone Butte, Alberta, 25.vii.75, leg. L. P. Grey; same V (11); ♂ D (12), W. of Kettle Falls, Ferry Co., WN, 8.vii.75, leg. L. P. Grey; same V (13); yellow ♀ D (14), Pavilion Mtn., 20 mi. S. Jesmond, Br. Col., 6.viii.73, leg. L. P. Grey; same V (15).

Me., on the strength of which I have once or twice in my list referred *Eurymus Pelidne* to northern New England, is nothing but the pallid female of this Cape Breton type, to which I would give the varietal name *laurentina*. Thirty-nine specimens were collected, of which ten were gynadromorphic females, eight pallid females, and the rest males." The specimens described were collected by one Ronald Thaxter on Cape Breton Island, and their ultimate disposition is not clear from Scudder's paper.

Description of a Neotype for *Eurymus philodice laurentina* Scudder 1875

Figs. 24-26

To clarify the name *laurentina* Scudder, I have selected a male specimen of *Colias interior* in the Canadian National Collection from Cape Breton Island and designated it as a neotype of *Eurymus philodice laurentina* Scudder. This specimen is illustrated in Figs. 24-25, with specimen labels in Fig. 26. The taxon *laurentina* Scudder is a junior synonym of *interior* Scudder. This specimen is described as follows:



Figures 16-21. Typical specimens of *C. interior* from the U.S. ♂ D (16), Craig Mtns., Nez Perce Co., ID, 11.vii.81; same V (17); "alba" ♀ D (18), same data; same V (19); wide-bordered ♂ D (20), Cheboygan Co., MI, 29.vi.51, leg. E. Voss; same V (21).

Neotype and Location: The taxon *laurentina* is redescribed from a male specimen collected by J. McDunnough at Baddeck, Cape Breton Is., Nova Scotia on 16.vii.1938. This specimen is placed in the CNC, Ottawa, Canada.

Diagnosis and Description: WINGS, Right FW costa 21 mm. Dorsal ground color bright lemon yellow (no Smithe equivalent, paler than Spectrum Yellow #55). Black borders narrow (14% of thorax-to-margin distance measured at mid-cell Cu_1). Wing veins transecting black border only very slightly outlined in yellow. DFW cell spot oval with prominent pale orange pupil. DHW discal spot orange and prominent. Wing cilia strongly colored and close to Vinaceous (Smithe #3), with some yellow color at outer angle of HW. VFW color similar to that of DFW, but darker towards apex, and dusted with black scales along the costal margin. DFW cell spot duplicated in form and color V. VHW ground color close to Spectrum Yellow (Smithe #55), moderately dusted basally with black scales. Pinkish spot on DHW costal margin just basad of vein R_5 intersection. DHW cell spot prominent, with pearly pupil overscaled in pink, and surrounded by dense ring of vinaceous scales and distal halo of more diffuse similarly colored scales. HEAD. Antennal length 8.5 mm (= 40.5% of FW costa length); shaft Vinaceous; club tan V, darker D. Frons Vinaceous; palpi Vinaceous-tipped. Eyes smooth and brown. Thoracic vestiture dorsally Vinaceous (cephalad) and pale yellow (caudad); yellow ventrally. Abdominal vestiture pale

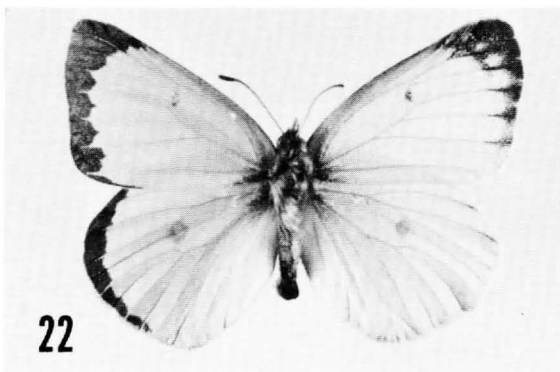


Figure 22. Bilateral gynandromorph of *C. interior* (D), Ottawa, Ontario, 28.vii.78, leg. R. A. Layberry, Specimen in CNC.

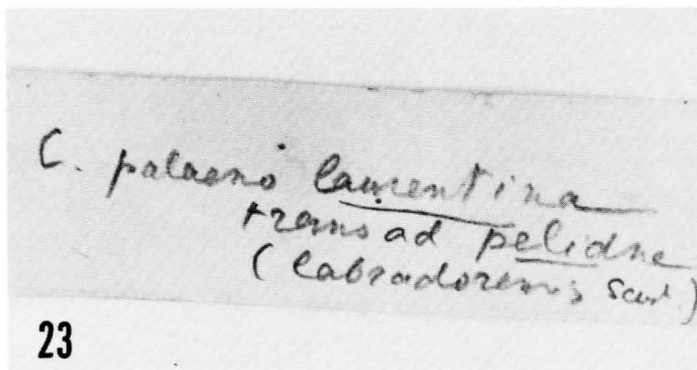


Figure 23. Scudder label in tray with syntypes of *C. labradorensis*. Label reads: "*C. palaeno laurentina trans ad [transitional to] pelidne (labradorensis Scud.)*".

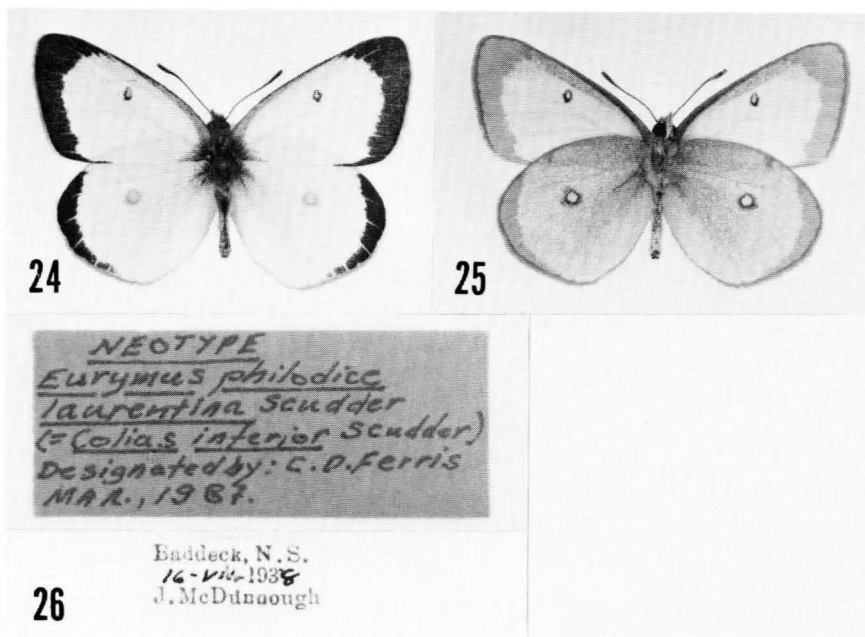
yellow. Legs primarily pale yellow, heavily covered by Vinaceous hairs with some interspersed yellow hairs.

Synonymy: The taxon *laurentina* Scudder is herewith sunk as a junior synonym of *interior* Scudder.

Distribution of *Colias interior*

This species ranges from Labrador and New England westward in the northern United States and southern Canada across the Great Lakes region to Oregon, Washington and northern British Columbia. Isolated colonies occur in the Appalachian Mtns. south to Virginia. Fig. 27 is a distribution map, and specific records will be found in the Appendix to this paper.

In the West, the ranges of *C. interior* and *C. pelidne skinneri* Barnes overlap. This has led some authors to suggest that they may be conspecific, such as the statement in Opler and Krizek, 1984:67 regarding the range of *interior*: "This butterfly ranges from... to Manitoba, where it blends with the Pelidne Sulphur (*Colias pelidne*). This sulphur may occur even farther west, in Oregon and British Columbia, but the identity of far-western populations is uncertain." With the exception of a colony in Valley Co., Idaho (treated in a subsequent section of this paper), *C. interior* can be very clearly separated from *C. pelidne* in western North America and there is no uncertainty concerning the identities of these two species, as discussed immediately below.



Figures 24-26; Neotype ♂ of *Eurymus philodice laurentina* Scudder = *Colias interior* Scudder from Baddeck, Cape Breton Is., Nova Scotia. D (24); V. (25); specimen labels (26). Neotype label is red inscribed with black ink. Specimen in CNC.

Separation of *Colias interior* from *Colias pelidne*

These species can be separated on the basis of phenotype and to some degree, habitat preference. *C. interior* is normally associated with transitional open spaces including boggy areas and moist forest clearings. Males may be found patrolling power line cuts, and along roadsides where they avidly "puddle". In the eastern Arctic (Labrador and Newfoundland), I have most often encountered *pelidne* in open moist-meadow benches along the ocean shoreline. In the western Arctic (Yukon Territory), where it is decidedly uncommon, I have found it only over open moist tundra (tussocks), where it is sympatric with *C. gigantea gigantea* Strecker, but appears earlier in the season than the latter species. *C. pelidne skinneri* normally occurs in forest clearings and over open heaths. Males patrol along roads and forest fire breaks. Table 2 summarizes the morphological differences between adults of *interior* and *pelidne*.

***Colias pelidne pelidne* Boisduval and Le Conte 1829**

Colias pelidne Boisduval and Le Conte, 1829. Hist. Lépid. Amérique sept.:66; pl. 22, figs. 4-5 [the figure caption states "femelle", but a male is shown]. Both sexes are illustrated in the Supplement to Boisduval, 1832 (Pl. 8, figs. 1-3). TL — NE coast of Labrador. The HT is apparently lost. At the time when the Oberthür collection was sold to the BM (N.H.), Barnes arranged to purchase the type specimens of nearctic species contained therein. Most of these types represented Boisduval names, but some Boisduval and Le Conte names may have been included. The Barnes collection was ultimately placed in the NMNH. The type of *pelidne*, however, cannot be located in the NMNH holdings (*vide* R. K. Robbins). It may be at the BM (N.H.). The type is adequately represented by the plate figures noted above.

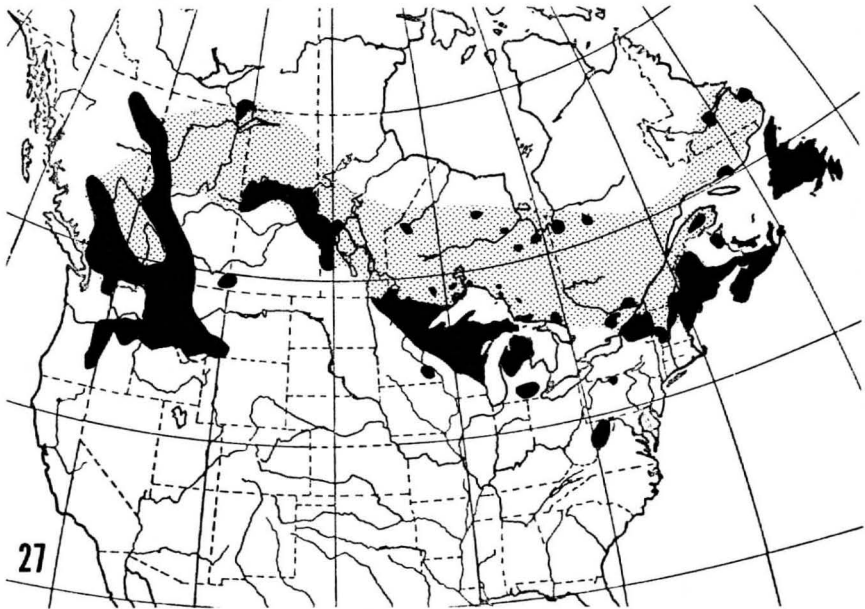


Figure 27. Distribution map for *C. interior*. The blackened areas represent records validated by specimens. The additional shaded area represents the probable overall range of this species.

- = *Colias labradorensis* Scudder, 1862. Proc. Boston Soc. Nat. Hist., 9:107. TL — Caribou Island, Straits of Belle Isle, Labrador. The MCZ collection contains four specimens (3 ♂♂, 1 ♀) with the associated label shown in Fig. 23. The specimens, however, bear pin labels as shown in Figs. 30, 33 and 36 clearly designating them as *labradorensis*. All four specimens bear red labels with black printing: "M.C.Z./Type/5082". One of the males (Figs. 28-30), however, carries a label with "Type" handwritten in black ink, and I hereby designate this specimen as the lectotype representing the taxon *labradorensis* Scudder. The pin labels are shown in Fig. 30. The lectotype label is red with black printing. Two of the three remaining specimens are illustrated in Figs. 31-36.
- = *Colias palaeno laurentina* [Scudder, *vide* F.M. Brown]; label in MCZ collection.
- = *Colias pelidne* syn. *labradorensis* Scudder; W. H. Edwards, 1872:9.
- = *Colias pelidne* Boisduval; Strecker, 1878:81.
- = *Colias pelidne* syn. *labradorensis* Scudder; Strecker, 1878:81.
- = *Colias pelidne* syn. *labradorensis* Scudder; Skinner, 1898:70.
- = *Eurymus pelidne* (Boisduval); Dyar, 1902:10.
- = *Eurymus pelidne* syn. *labradoriensis* [*sic*] (Scudder); Dyar, 1902:10.
- = *Eurymus pelidne* (Boisduval and Le Conte); Barnes and Benjamin, 1926a:8.
- = *Eurymus pelidne* syn. *labradorensis* (Scudder); Barnes and Benjamin, 1926a:8.
- = *Colias pelidne* Boisduval; Holland, 1931, 1949:295.
- = *Colias pelidne* var. *labradorensis* Scudder; Holland, 1931; 1949:295.
- = *Colias pelidne pelidne* Boisduval and Le Conte; McDunnough, 1938:8.
- = *Colias pelidne labradorensis* Scudder; McDunnough, 1938:8.
- = *Colias pelidne pelidne* Boisduval and Le Conte; McHenry, 1963:210; 218.
- = *Colias pelidne labradorensis* Scudder; McHenry, 1963:210; 217.
- = *Colias pelidne pelidne* Boisduval and Le Conte; dos Passos, 1964:43.

Table 2. Morphological Differences Between *C. interior* and *C. pelidne*

CHARACTER:	<i>C. interior</i>	<i>C. pelidne</i>
DHW Discal Spot:	Prominent; usually orange-colored.	Subdued; normally concolorous with wing ground color; sometimes with orange tinge, especially in females of <i>skinneri</i> .
VHW Discal Spot:	Prominent: large silvery pupil; suggestion of double rim in many specimens; occasionally with small superior satellite spot.	Small; reduced or absent pupil (more prominent in <i>skinneri</i>); heavily rimmed with "dusty-rose" scales; occasionally with very small & frequently detached superior satellite spot or dot.
FW Wing Shape:	Outer margin often distinctly rounded.	Outer margin usually nearly straight.
Ventral Color:	Bright lemon yellow with speckling of black scales, except in "alba" form.	Heavily dusted with black scales, often giving the appearance of mossy green, especially in females of <i>pelidne</i> .
Female Color:	Yellow; rarely white (see Table 1).	White; rarely yellow except in females of <i>skinneri</i> (see Table 1).
Development of DFW Marginal Band in ♀♀:	Frequently poorly developed; relatively solid & without "windows" when prominent.	Often fully developed (especially in <i>skinneri</i>) with open "windows" showing wing ground color.

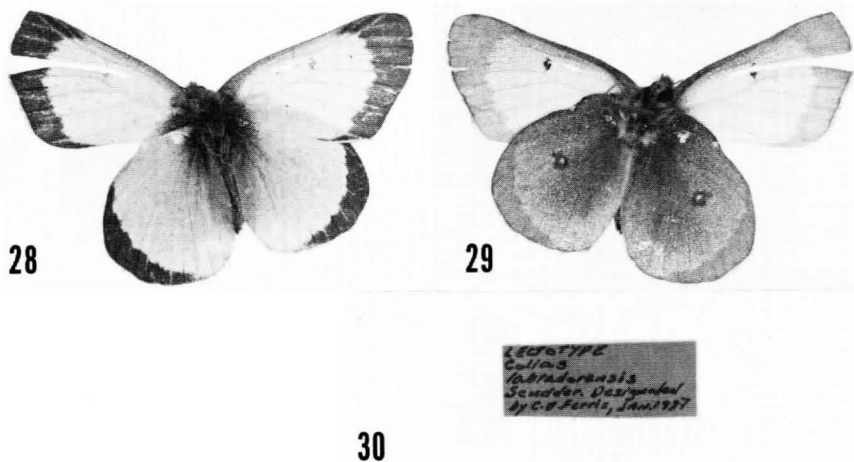
- = *Colias pelidne labradorensis* Scudder; dos Passos, 1964:43.
- = *Colias pelidne pelidne* Boisduval and Le Conte; Miller and Brown, 1981:83.
- = *Colias pelidne* syn. *labradorensis* Scudder; Miller and Brown, 1981:83.

Infrasubspecific Names

- Colias pelidne pelidne* ab. "moeschleri" Grum-Grschimailo, 1894:379. TL — "Labrador", HT in ZMUH. This is a yellowish female form in which the FW apical markings are well developed. The holotype is figured in Verity, 1911:pl.40,f.22.
- Colias pelidne pelidne* ab. "mira" Verity, 1911:347; pl. 68. TL — Ravea, Labrador. HT in BM (N.H.) This is a melanic aberration of the male in which the dark borders are wider than normal and the wing veins are heavily overscaled with black.

Discussion

The original description of *pelidne* (in both Latin and French) reasonably approximates this butterfly. The opening French statement: "A bit larger than *Col. Palaeno*, which it closely resembles," is not very accurate, however. The VHW discal spot in *pelidne* is subdued and normally heavily overscaled and rimmed with pink (dusty-rose) scales, while in *palaeno* this spot is apparent and white. The caption to the accompanying plate states that a female is illustrated. A male is shown, and both the Latin and French versions of the original description clearly describe the yellow color of the specimen. The females of nominal *pelidne* are white. The geographic range stated for *pelidne* is Greenland, Iceland and Labrador. The specimen upon which the description was based came from Labrador (most likely from one of the early Moravian settlements such as Nain), and subsequent authors have inferred Labrador to be the type locality. This species occurs only in the New World, and it does not occur in either Greenland or Iceland. The name *labradorensis* represents a redescription by Scudder of *pelidne* Boisduval and Le Conte. Typical specimens are shown in Figs. 37-42.

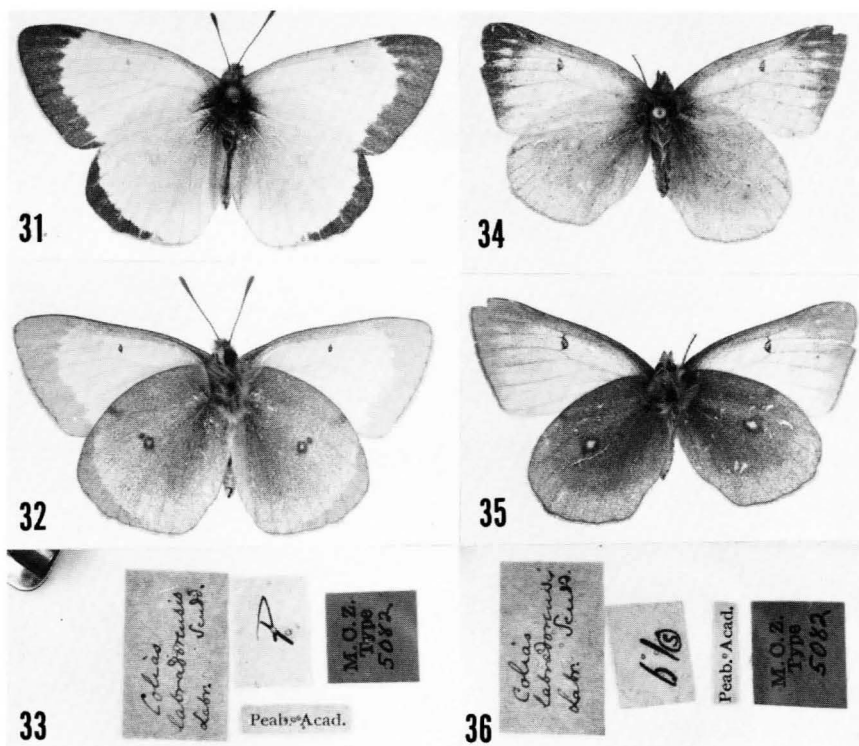


Figures 28-30. Male lectotype of *C. labradorensis* Scudder = *C. pelidne pelidne* Boisduval and Le Conte. Dorsal (28). Ventral (29). Specimen labels (30).

Colias pelidne skinneri Barnes 1897
Figs. 49-58 (typical)

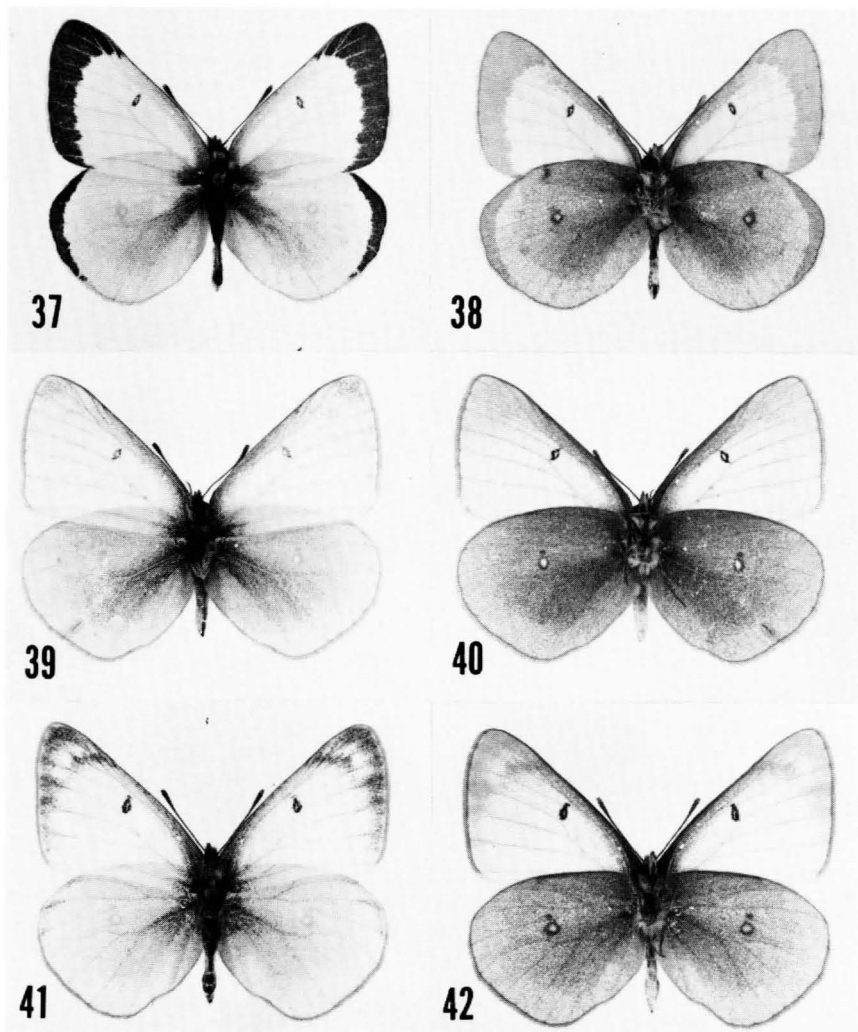
Colias pelidne skinneri Barnes, 1897. Canadian Ent., 29:41-42, TL — Yellowstone N.P., Wyoming. LT in NMNH. Barnes described *skinneri* from "15 males and 7 females". In the emendations to their Check List [1926b. Bull. S. Calif. Acad. Sci., 25:89], Barnes and Benjamin restricted the name to a lectotype, specifically the white female specimen in the series. This specimen is shown in Figs. 43-44. The yellow female phenotype was described as f. "neri". This specimen is shown in Figs. 45-46. Holland (1930: pl. 67, figs. 20-21) illustrated the "types" (actually pseudotypes) of *skinneri*. A male is shown in fig. 20 and a female in fig. 21. The female that Holland illustrated is yellowish and thus must be considered a pseudotype along with the accompanying male.

- = *Colias pelidne* var., Strecker, 1873:69.
- = *Colias pelidne interior* Scudder syn. *pelidne* var.; Strecker, 1878:81.
- = *Colias pelidne skinneri* Barnes; Skinner, 1898:70.
- = *Eurymus pelidne skinneri* (Barnes); Dyar, 1902:10.
- = *Eurymus pelidne skinneri* (Barnes); Barnes and Benjamin, 1926a:8.
- = *Eurymus pelidne minisni* (Bean); Barnes and Benjamin, 1926a:8 Syn. Nov.
- = *Colias skinneri* Barnes; Holland, 1931; 1949:296.
- = *Colias pelidne skinneri* Barnes; McDunnough, 1938:8.



Figures 31-36. Additional specimens from type series of *C. labradorensis*. ♂ D (31); same V (32); same, specimen labels (33); ♀ D (34); same V (35); same, specimen labels (36).

- = *Colias pelidne minisni* Bean; McDunnough, 1938:8.
- = *Colias pelidne minisni* Bean; Jones, 1951:5.
- = *Colias elis minisni* Bean; McHenry, 1963:217.
- = *Colias pelidne skinneri* Barnes; McHenry, 1963:210; 218.
- = *Colias pelidne minisni* Bean; dos Passos, 1964:43.
- = *Colias pelidne skinneri* Barnes; dos Passos, 1964:43.
- = *Colias pelidne minisni* Bean; Miller and Brown, 1981:83.
- = *Colias pelidne skinneri* Barnes; Miller and Brown, 1981:83.



Figures 37-42. Typical specimens of *C.p. pelidne*. ♂ D (37), Hwy. 1,2.8 mi. S. Mummichog Park, NFLD, 8.vii.73; same V (38); ♀ D (39), Nain, Labrador, 14.vii.73; same V (40); ♀ D (41), same data as ♂; same V (42).

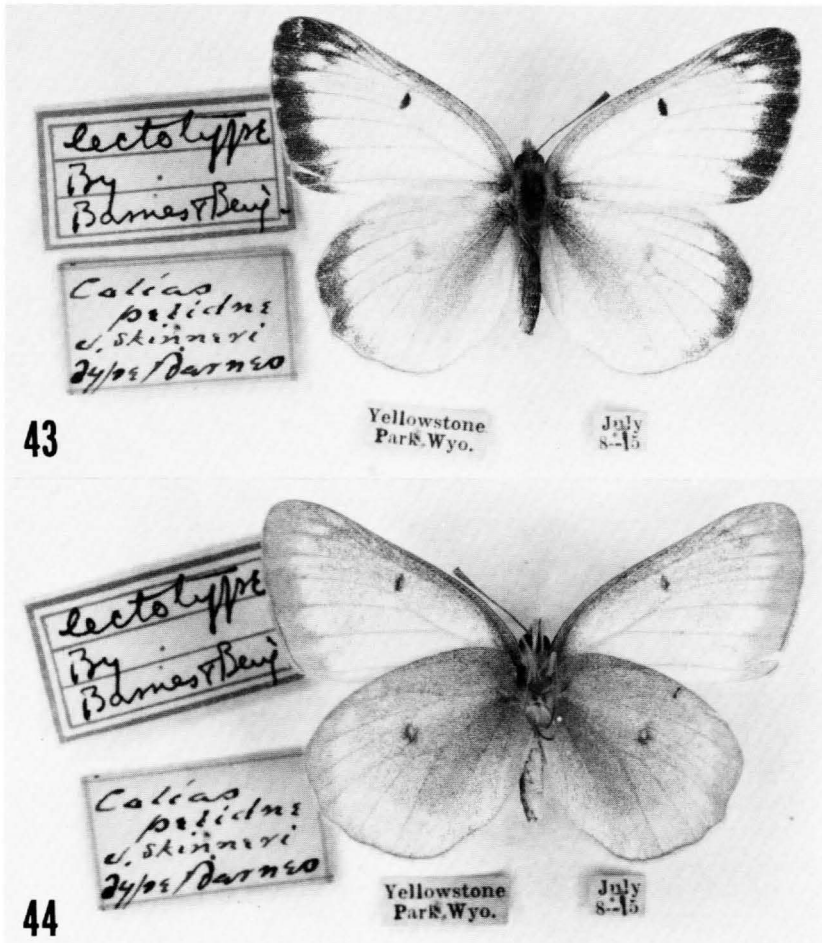
Infrasubspecific Names

Eurymus pelidne skinneri f. ♀ "neri" Barnes and Benjamin, 1926b:89. TL — Yellowstone Park, Wyoming. HT in NMNH. This name applies to the yellow female phenotype shown in Figs. 45-46.

Eurymus pelidne minisni f. ♀ "isni" Barnes and Benjamin, 1926b:89. TL — Laggan, Alberta. HT in NMNH. This name applies to the yellow female phenotype. The type is illustrated in Figs. 47-48.

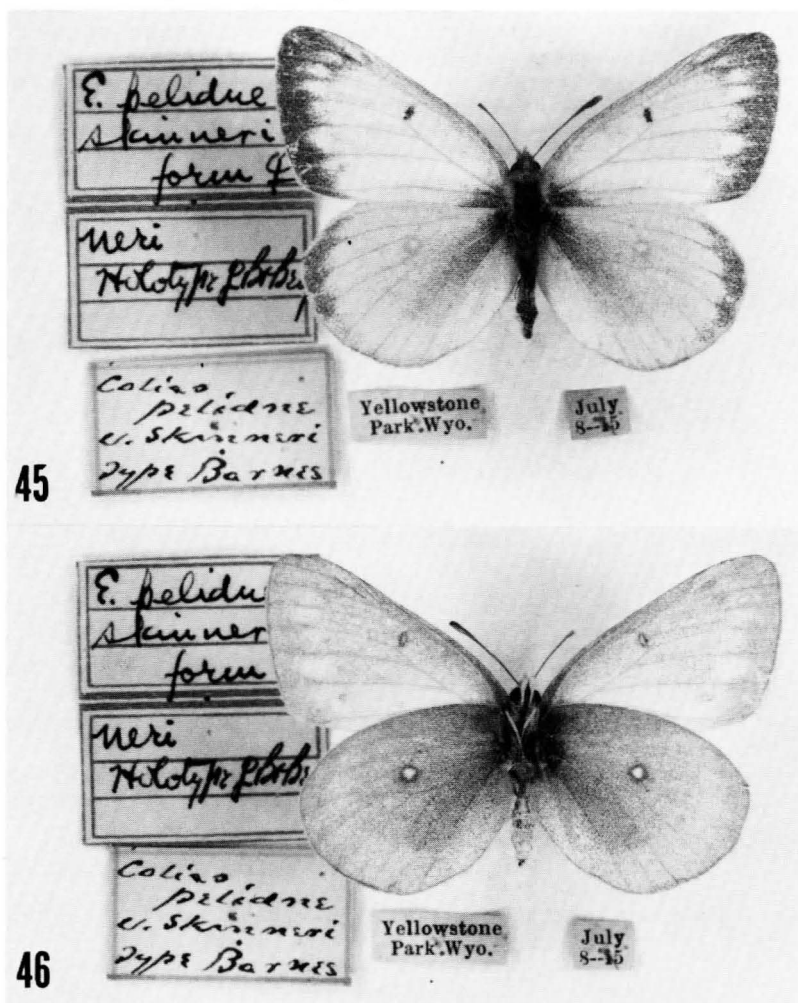
Discussion

The nomenclature relating to the Rocky Mtn. populations of *pelidne* is confused. The taxon *minisni* is an enigma. Bean (1895) never provided a description, nor apparently



Figures 43-44. Female lectotype of *Colias pelidne skinneri*. Dorsal (43). Ventral (44). NMNH photographs. Specimen in NMNH.

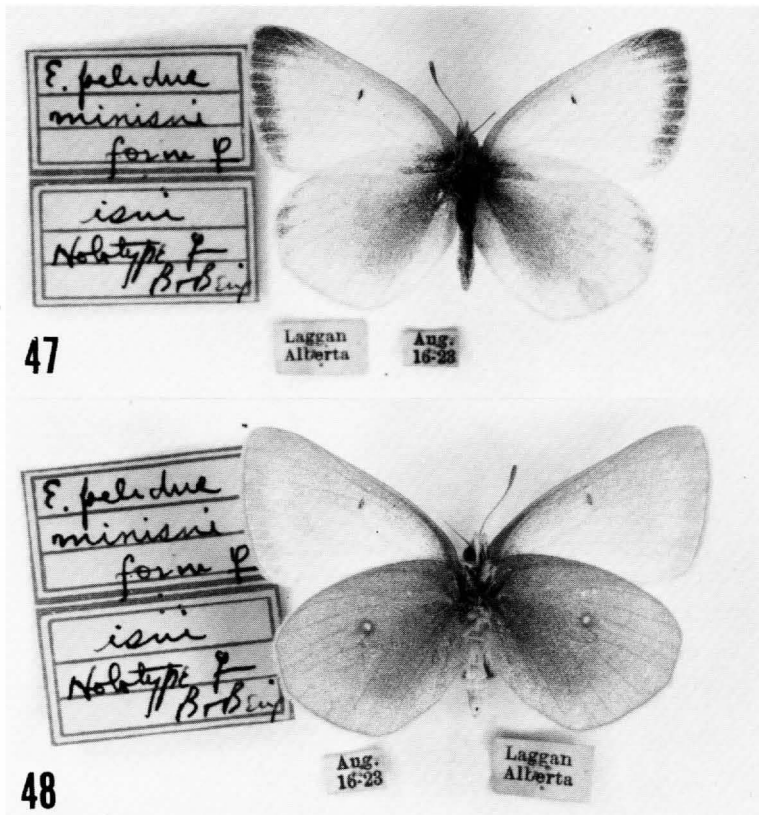
did he ever designate or illustrate a type specimen. In discussing what we now recognize as *Colias meadi elis* Strecker, Bean stated as follows: "I am now able to speak definitely in regard to the supposed "albino ♀" of *Elis*. Mr. Strecker's determination proves to have been based upon several ♀ examples of a Laggan butterfly closely allied to *Pelidne*, which I have in correspondence designated by the MS, name *Colias minisni*, — of which perhaps further hereafter. Having sent Mr. Strecker fine examples of this pale female *Colias*, and also of its appropriate male, he distinctly recognized the ♀ as the original of his *Elis* albino ♀, and the latter determination is to be considered recalled." Bean made no further mention of *minisni*. I interpret this narrative as meaning that Strecker mistook an "alba" form of a *pelidne* subspecies for the albino female form of *meadi elis*. On the other hand, McHenry (1963:217) interpreted Bean's narrative differently, and incorrectly.



Figures 45-46. Female holotype of *Colias pelidne skinneri* f. "neri", Dorsal (45). Ventral (46). NMNH photographs. Specimen in NMNH.

With respect to Bean's comments regarding *minisni*, McHenry stated: "Intended to withdraw his Ms. name for what he considered the albinic female of *elis* Strecker." In an earlier paper (1890:127), Bean clearly stated that what Strecker took (or mistook) as the white female form of *elis*, was in fact the white female of another species, about which Bean stated: "It is near to *Pelidne* and *Scudleri*, as its ♂ sufficiently demonstrates, and of course not specially close to *Elis*; its ♀, however, has some resemblance to *Elis* ♀." Albinic females of *meadi elis* do occur rarely (see Curtis and Ferris, 1985). It is not clear, however, if the white females that confused Strecker, and perhaps Bean, belonged to *pelidne*, *meadi elis*, or to what we now recognize as *nastes streckeri* Grun-Grschimailo. All three species occur in the vicinity of Laggan [Lake Louise], and the females of *streckeri* in maculation more closely resemble females of *elis* than do those of *pelidne*. The only *Colias* that Strecker (1872-1900) illustrated is *C. dimera* Doubleday & Hewitson from South America. There is no discussion in Strecker of *minisni* and only a brief note about *elis*.

Regardless of the interpretation of Bean's narrative, it appears that *minisni* Bean is a *nomen nudum*. It was never described, and it was never illustrated. Skinner did not include this name in his 1898 list, nor did Dyar in his 1902 list. It was misspelled *menisme* by Verity (1905:xxxiv), who did not recognize the taxon as a valid subspecies. Verity, however, exhibited a very poor understanding of North American *Colias*. The name was

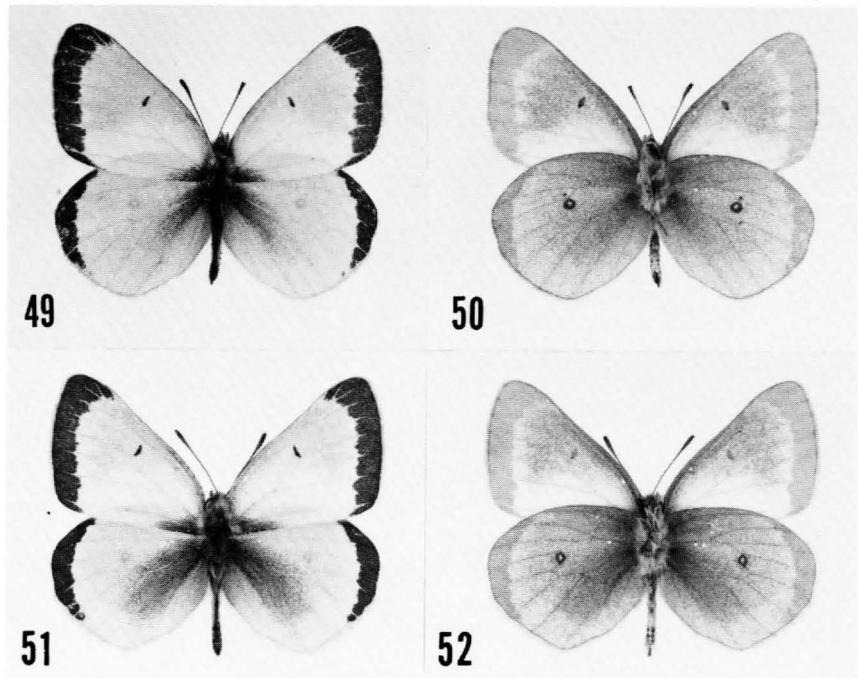


Figures 47-48 Female holotype of *Colias pelidne minisni* f. "isni". Dorsal (47), Ventral (48). NMNH photographs. Specimen in NMNH.

next published by Barnes and Benjamin in their list in 1926. In the interim, Barnes described *C. pelidne skinneri* in 1897, which was included in Skinner's list. In his description he stated: "Mr Bean, in CANADIAN ENTOMOLOGIST, Vol. XXII., p. 127 mentions specimens of a *Colias* [sic] intermediate between *Scudderi* and *pelidne*, and it is probable that this [the species being described by Barnes] is the same, but as I have none of his material, and he gives no description of it, I am not certain." Barnes made no mention of the name *minisni*. Holland (1931; 1949:296) mentioned only *Colias skinneri* Barnes with no mention of *minisni*. He gave the range of *skinneri* as: "Wyoming northward through Idaho and Montana to Alberta."

Under the Code of the I.C.Z.N., there are several possible lines of action. A petition could be filed with the I.C.Z.N. to place the name *minisni* in the "Official Index of Rejected and Invalid Specific Names in Zoology". If it had been properly described, under the Principle of Priority, *minisni* Bean would be a prior name (by two years) over *skinneri* Barnes; however, *minisni* Bean was not properly described. Based upon the format of the original description of the female f. "isni" by Barnes and Benjamin on page 89 of the emendations to their Check List, one could attribute the name *minisni* to Barnes and Benjamin 1926. In both the original Check List and the emendations, *skinneri* occupies line priority over *minisni*. If Barnes and Benjamin are taken to be "First Revisers" (Code: Art. 24), then *skinneri* Barnes has precedence over *minisni* Bean. In either case, whether *minisni* Bean is considered to be a *nomen nudum*, or whether it is attributed to Barnes and Benjamin, 1926, the appropriate trinomial to apply to the Rocky Mtn. race of *pelidne* appears to be *C. pelidne skinneri* Barnes, and this is the approach that I follow herein.

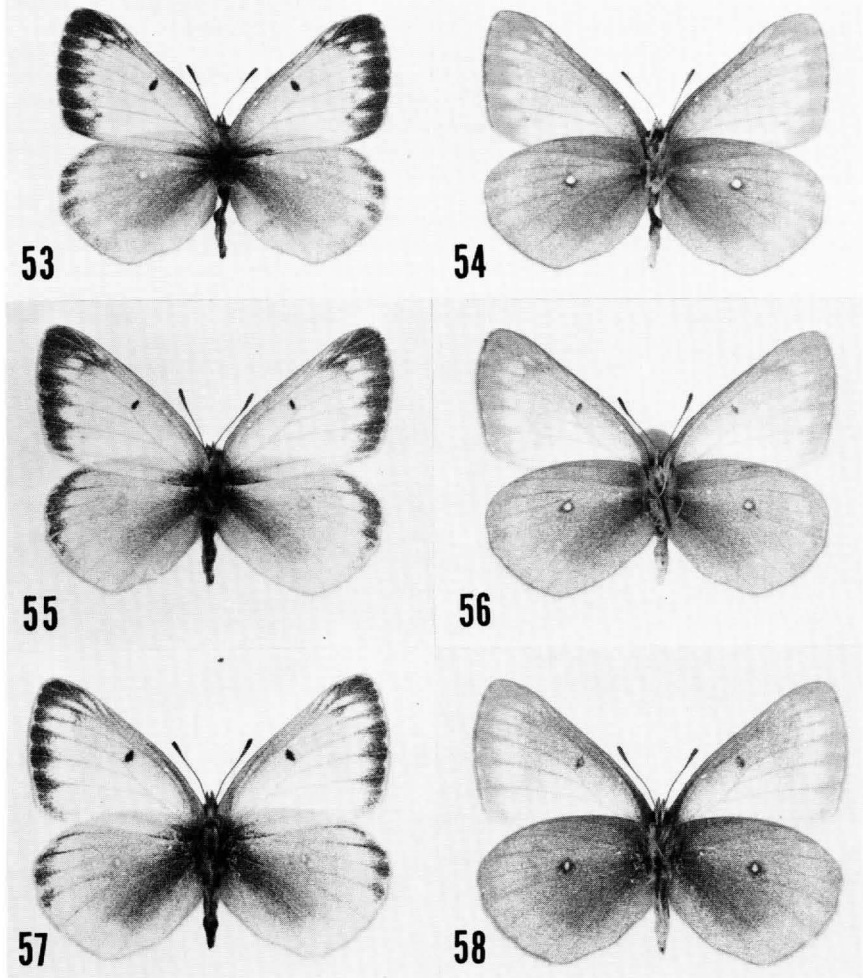
As indicated by the distribution map for *pelidne* (Fig. 59), there is considerable geographic separation between the nominal subspecies and *skinneri*. Males of the two subspecies



Figures 49-52. Typical males of *C. pelidne skinneri*. D (49), vic. Palmer L., Bridger Wild., Sublette Co., WY, 1.viii.70; same V (50); D (51), Nigel Ck. Tr., Banff Park, Alberta, 18.vii.70; same V (52).

are similar, but *skinneri* tends to manifest a more saturated yellow. The main differences appear in the females. I have never seen, nor have I found any references to yellow females of *p. pelidne* (ab. "moeschleri" is only yellowish). They are uniformly white in ground color, and the dark dorsal dusting of the wings is much reduced when compared to typical *skinneri*. Habitat preferences of the two subspecies have been described above in the discussion relating to the separation of *C. interior* from *C. pelidne*. Data on yellow-white female color frequency in this species are presented in Table 1.

I have examined one male specimen that is either a color aberration or a hybrid between *skinneri* and *C. m. meadi* W. H. Edwards. This specimen was collected by A. B. Klots and is at AMNH. Its color is orange, as in *meadi*, and the dorsal dark wing borders are



Figures 53-58. Typical females of *C. p. skinneri*. Yellow form D (53), Doubletop Mtn. Tr., Bridger Wild., Sublette Co., WY, 2.viii.70; same V (54); "alba" form D (55), Elkhart Park, Bridger Nat. For., Sublette Co., WY, 31.vii.70; same V (56); "alba" form D (57), Nigel Ck. Tr., Banff Park, Alberta, 24.vii.69, leg. J. S. Nordin; same V (58).

similar in form to those associated with *meadi*, but otherwise the maculation resembles *skinneri*. I illustrated this specimen in an earlier paper (1972:22, figs. 79-80).

Distribution of *Colias pelidne*

The distribution of *Colias pelidne*, based upon verifiable collection records (Fig. 59), contradicts most previously published information. The restricted and disjunct distribution shown in Fig. 59 simply may reflect, in part, lack of collecting because of the remote locations in which the nominate subspecies occurs, and in fact the distribution may be more extensive. On the other hand, many areas in the western Arctic have been intensively collected and this species has not been recorded. Questionable records (see Appendix) have not been plotted. For the most part, *C. p. pelidne* has been recorded from coastal areas only, with the exception of the Ogilvie Mtns. in the Yukon Territory and Knob Lake, Quebec.

The distribution of the Rocky Mtn. region montane subspecies *skinneri* is compact and continuous. Based upon the geographic separation between the two subspecies. It is quite possible that *skinneri* may be a separate (sibling) species, but this requires considerable further study.

Colias pelidne skinneri — Valley Co., Idaho Population Figs. 60-67

This population was first discovered by J. H. Shepard and has subsequently been studied by N. S. Curtis and the author. It's center is in Valley Co., Idaho in the Warm Lake — Stolle Meadows region from which it radiates to the geographic borders of the county. Superficially these butterflies resemble *C. pelidne skinneri*, but in habitat preference and certain phenotypic aspects, they show an affinity toward *interior*. The adult butterflies frequent open boggy areas in coniferous forest in association with several species of *Vaccinium*. Both sexes freely nectar at yellow composites. The females tend to remain

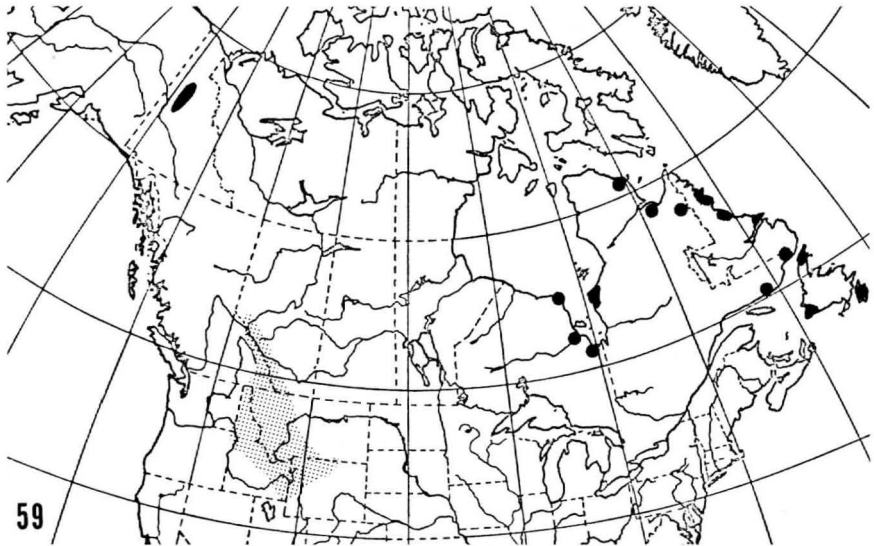


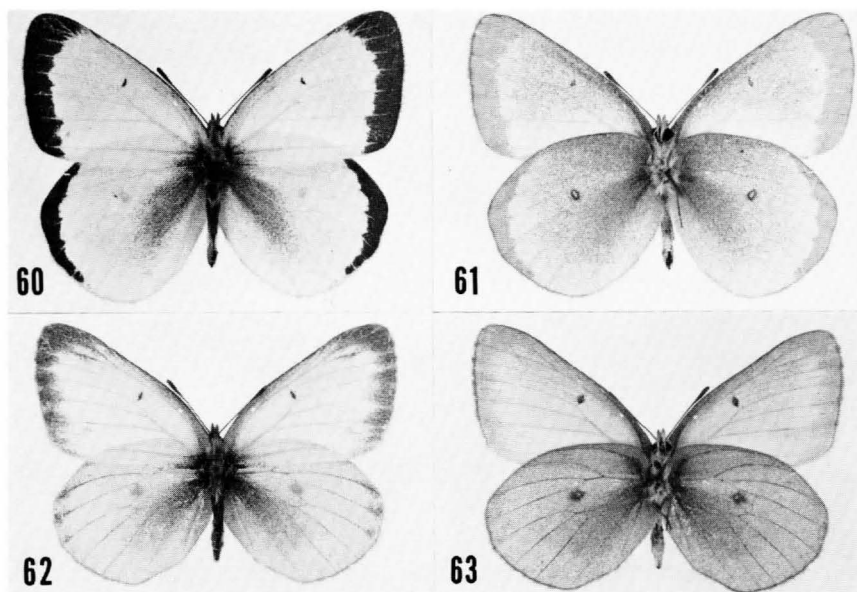
Figure 59. Distribution map for *C. pelidne*. The blackened areas represent verifiable records for *C. p. pelidne*. The shaded area represents the known distribution of *C. p. skinneri*. Questionable records have not been plotted.

in the forest glades, while the males range more widely and may be found "puddling" along roadsides. In these habits, they resemble *interior*.

The author's study series consists of 47 males and 23 females. Of the latter, 22 are strongly yellow as in the males, and only one is white. These numbers are typical of the material examined in the J. H. Shepard and N. S. Curtis collections. As shown in Table 1, the yellow female form predominates in *interior*, while the white female form is dominant in *pelidne skinneri*. The dominance of the yellow female phenotype in the Valley Co. population demonstrates an *interior* trait. Typical *interior* traits manifested by some of the males include pronounced rounding of the FW outer margin and enlarged VHW discal spot. Occasional specimens exhibit some orange color in the DHW discal spot as is found in males of *interior*.

Unusual phenotypes of several other butterfly species are found in this same region, and include, among others, *Phyciodes pratensis* (Behr), *Speyeria atlantis* ssp. and *Speyeria hydaspe sakuntala* (Skinner). I have taken several specimens which appear to be hybrids between *S. atlantis* and *S. hydaspe*. One can speculate that this area, owing to its topography (deep moist valleys surrounded by heavily-forested ridges), has served as both a refugium and isolating mechanism for some species.

Based upon the data available for this *Colias* population, I conclude that it has resulted from hybridization between *Colias interior* and *C. pelidne skinneri* at some indeterminate time in the past. While these butterflies generally resemble *skinneri*, certain *interior* traits are manifested both in phenotype and behavior. I do not consider *interior* and *pelidne* to be conspecific, since these two butterflies are clearly separable at the species level as enumerated in Table 2. The Valley Co., Idaho population, however, does indicate that these two species are closely related.



Figures 60-63. Specimens of *C. p. skinneri* from Stolle Meadows, Valley Co., ID, 13.vii.83 showing traits of *C. interior*. ♂ with narrow wing borders and rounded FW outer margins, D (60); V (61); ♀ with *interior*-like DFW dusting, D (62); V (63). Ventral markings are typical of *skinneri*.

Colias palaeno (Linnaeus)

C. p. palaeno (Linnaeus) occurs in Scandinavia, and other subspecies are distributed from western Europe to Japan. Petersen (1947:364-367) briefly discussed the overall geographic distribution of this species, and more specifically, geographic variation in Fennoscandia. Two subspecies occur in North America as discussed below. Higgins and Riley (1975:58) have suggested that the North American butterfly may be a separate species through their comment regarding the geographic distribution of *palaeno*: "Perhaps also in N. America." North American specimens do differ to some extent in size, color, and maculation from Old World material, but I cannot find sufficient differences to justify separate-species status based upon present evidence.

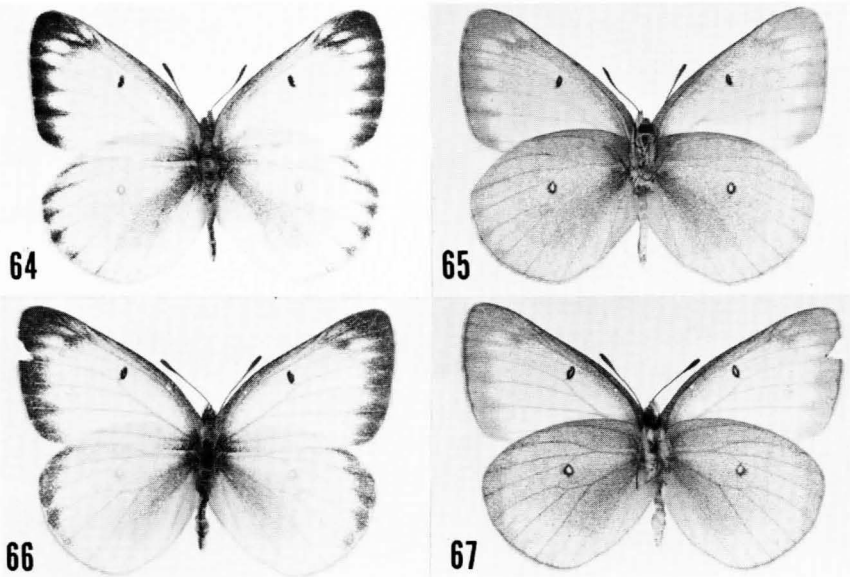
Colias palaeno chippewa W. H. Edwards 1872

Figs. 68-73

Colias chippewa W. H. Edwards, 1872. Synopsis of North American Butterflies:8. TL: "From Mackinzie's River", restricted by F. M. Brown [1973:54] to "near the west end of Great Slave Lake, North West Territory, Canada". LT in CM, designated by F. M. Brown [1973:53, fig. 11; #55]. Proposed to replace *C. helena* W. H. Edwards, 1863. Proc. ent. Soc. Philadelphia, 2:80; preoccupied by *helena* Herrich-Schäffer, 1844, Europaischer Schmetterlinge, 1: figs. 206-207. Brown stated in his text that he could not find an appropriate male to represent the lectotype of *chippewa* and *helena*, therefore he selected a female. The specimen shown in his plate (fig. 11), however, is a male. Several authors have attributed the name *chippewa* to William Kirby and Brown (1973) has discussed this matter.

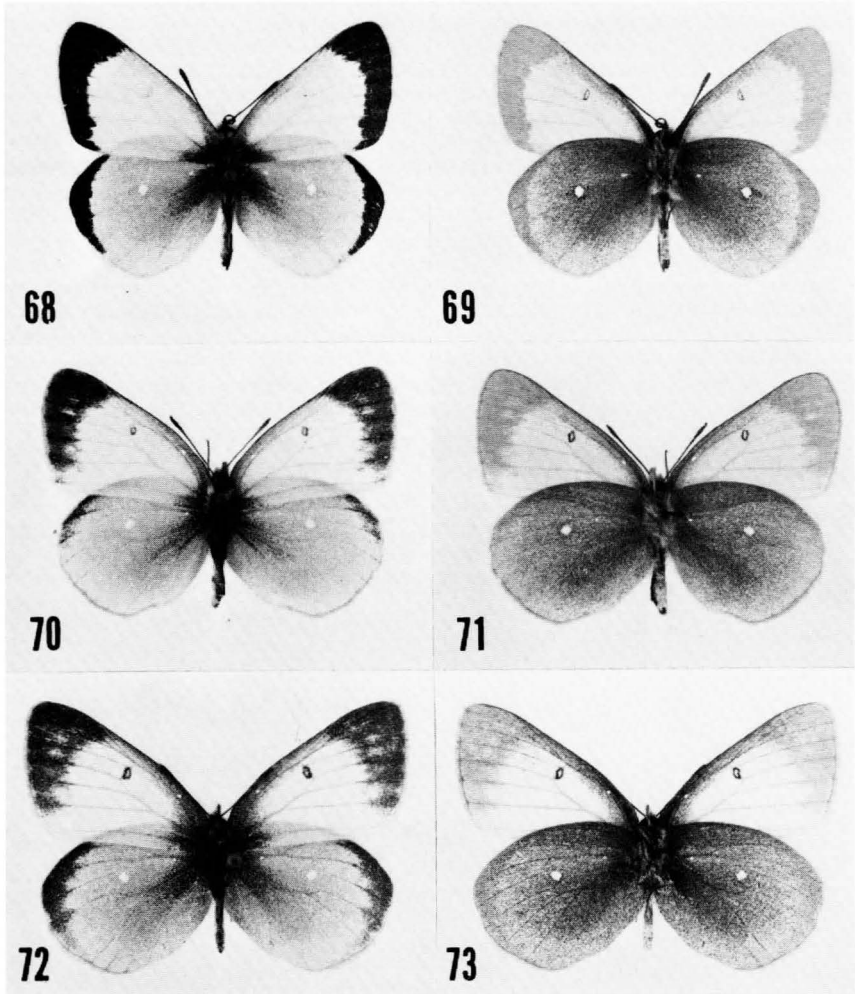
= *Colias helena* W. H. Edwards, 1863:80; preoccupied.

= *Colias palaeno* syn. *helena* W. H. Edwards; Strecker, 1878:81.



Figures 64-67. Typical females of *C. pelidne skinneri* from Valley Co., ID. Yellow form, 1 mi. S. of Deadwood, Boise Nat. For., 24.vii.84, D (64); same V (65); "alba" form, Stolle Meadows, 24.vii.84, D (66); same V (67).

- = *Colias palaeno* syn. *chippewa* W. H. Edwards; Strecker, 1878:81.
- = *Colias palaeno werdandi* [Skinner nec Herrich-Schäffer, 1848]; Skinner, 1898:70.
- = *Eurymus palaeno* syn. *chippewa* (W. H. Edwards); Dyar, 1902:10.
- = *Eurymus palaeno* syn. *helena* (W. H. Edwards); Dyar, 1902:10.
- = *Eurymus palaeno chippewa* (Kirby); Barnes and Benjamin, 1926a:8.
- = *Colias chippewa* Kirby; Holland, 1931; 1949:296.
- = *Colias palaeno chippewa* Kirby; McDunnough, 1938:8.
- = *Colias palaeno chippewa* W. H. Edwards; McHenry, 1963:210; 216.



Figures 68-73. Typical specimens of *C. palaeno chippewa*. ♂ W. side Darby Mtns., Dry Ck., Seward Pen., AK, 1.vii.86, D (68); same V (69); yellow ♀, Churchill, Manitoba, 11.vii.73, D (70); same V (71); "alba" ♀, km. 31.5 Hwy. 11 W. of Mayo, YT, 14.vii.86, D (72); same V (73).

Infrasubspecific Names

Eurymus chippewa ♀ f. "kohlsaati" Gunder, 1931:45. TL — Mt. McKinley N.P., Alaska. HT in AMNH. This name applies to a yellow female form.

Discussion

The description of this species (as *helenae*) is accurate and requires no elaboration. Brown (1973) illustrated the lectotype. This species is immediately separated from all other North American arctic *Colias* by its prominent white DHW discal spot. The wing color of the females is generally white, but yellow examples do occur. Data on the frequency of female color morphs are presented in Table 1. Occasionally very pale males, bordering on white, are collected. I have yet to see, however, a truly white male as occurs in the females.

Colias palaeno baffinensis Ebner and Ferris 1977

Colias palaeno baffinensis Ebner and Ferris. 1977, J. Res. Lepid., 16(3):156-160. TL — Town of Frobisher Bay, Baffin Island, Northwest Territories. HT in AMNH.
= *Colias palaeno baffinensis* Ebner and Ferris; Miller and Brown, 1981:84.

Discussion

This subspecies is recognized by narrow DFW borders in the males, and the pronounced melanism of the ventral wing surfaces in both sexes. The geographic distribution of this subspecies, as presently known, is restricted to Baffin Island. The male holotype and female allotype were illustrated with their specimen labels in the original description. These specimens are shown herein as Figs. 74-77.

Distribution of *Colias palaeno*

Fig. 78 is a distribution map for North American *palaeno*. The subspecies *baffinensis* is restricted to SE Baffin Island. The subspecies *chippewa* is widely distributed in the western Arctic. In the eastern Arctic, only a few records are known from Ontario and Quebec. There are old citations for Labrador in the literature, but I cannot find any contemporary records.

Colias behri W. H. Edwards 1866 Figs. 79-82

- Colias behri* W. H. Edwards, 1866. Proc. ent. Soc. Phila., 6(2):201. TL — "Yo Semite Mountains", restricted to vic. Tioga Pass, Tuolumne-Mono Cos., California by F. M. Brown, 1973. Trans. Amer. ent. Soc., 99:51-52. LT in CMNH, designated by F. M. Brown, 1973. Trans. Amer. ent. Soc., 99:52.
- = *Colias behri* W. H. Edwards; Strecker, 1878:84.
 - = *Colias behri* W. H. Edwards; Skinner, 1898:71.
 - = *Eurymus behri* (W. H. Edwards); Dyar, 1902:11.
 - = *Eurymus behri* (W. H. Edwards); Barnes and Benjamin, 1926a:8.
 - = *Eurymus behri canescens* Comstock; Comstock, 1927:55.
 - = *Colias behri* W. H. Edwards; Holland, 1931; 1949:299.
 - = *Colias behri* W. H. Edwards; McDunnough, 1938:9.
 - = *Colias behri* W. H. Edwards; McHenry, 1963:210; 211.
 - = *Colias behri* W. H. Edwards; dos Passos, 1964:44.
 - = *Colias behri* W. H. Edwards; Miller and Brown, 1981:84.

Infrasubspecific Names

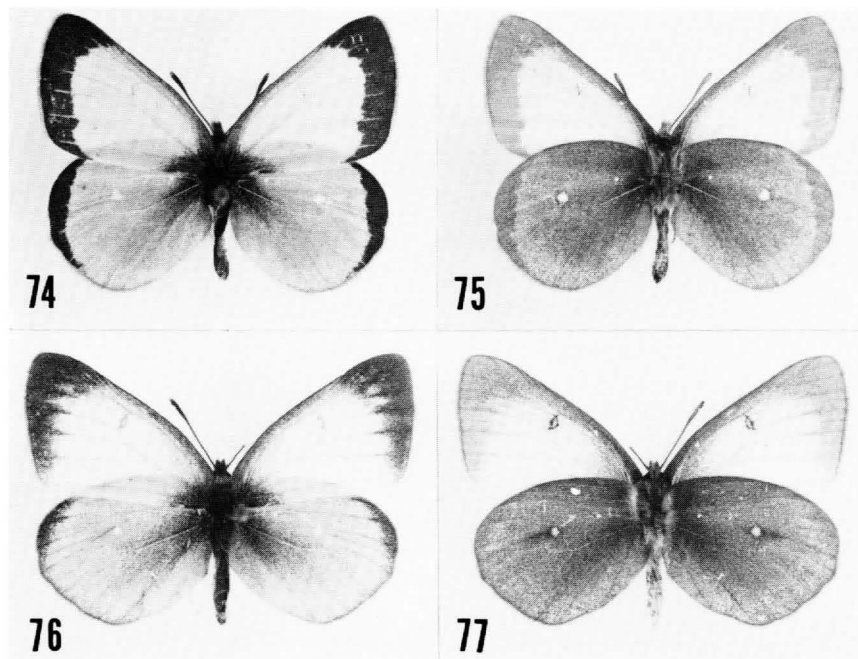
Eurymus behri ♀ f. "canescens" J. A. Comstock, 1925:286. TL — Tioga Pass, Yosemite, California. HT in LACM. This name applies to the pale or "alba" female form.

Discussion

This little butterfly invariably seems to be included as an afterthought at the end of check lists. Although it appears to represent a relict restricted to the high Sierras in California, in general pattern *behri* is close to North American *palaeno*, as is especially evident in the form of the HW discal spot. It is possibly a sibling or sister species of *palaeno*, and one can speculate that the common ancestor existed prior to the most recent glacial period. Reported larval hosts include *Vaccinium caespitosum* Michx., *V. nivictum* Camp (this taxon is treated by many botanists as a synonym of *caespitosum*), and *Gentiana newberryi* Gray. The latter plant was listed by Comstock (1927:55) and has been carried through the literature ever since. It is undoubtedly in error and may represent an ectopic oviposition.

Distribution of *Colias behri*

This species occurs in July in high alpine moist meadows (above 8000' [2400m]) in the Sierra Nevada of California in Inyo, Tulare, Mono and Tuolumne Cos. Fig. 83 is a distribution map.



Figures 74-77. *Colias palaeno baffinensis* from Frobisher Bay, Baffin Is., NWT. Holotype ♂, 10.viii.73, D (74); same V (75); allotype ♀, 19.viii.76, D (76); same V (77). Specimens in AMNH.

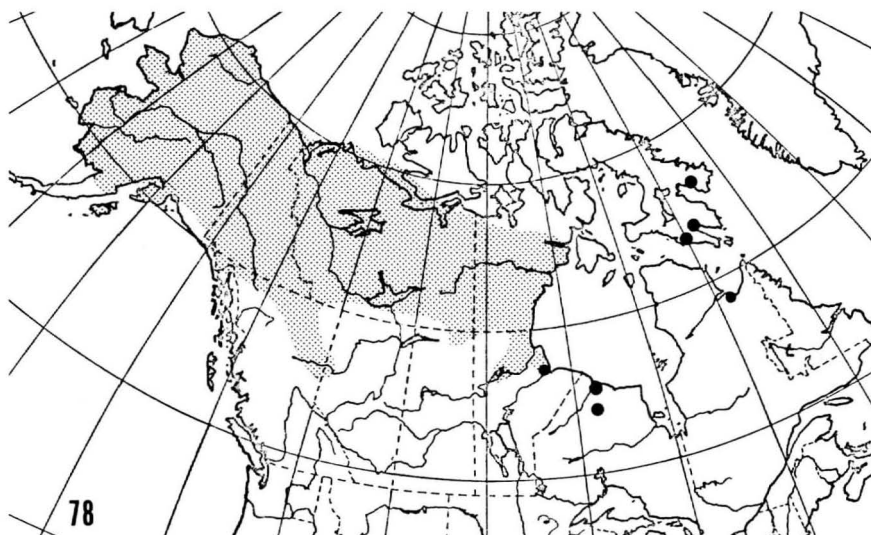


Figure 78. Distribution map for *C. palaeno* in North America. The shaded area is realistic of the western range of this species. Only verifiable records in the eastern Arctic are plotted as dots.

ACKNOWLEDGMENTS

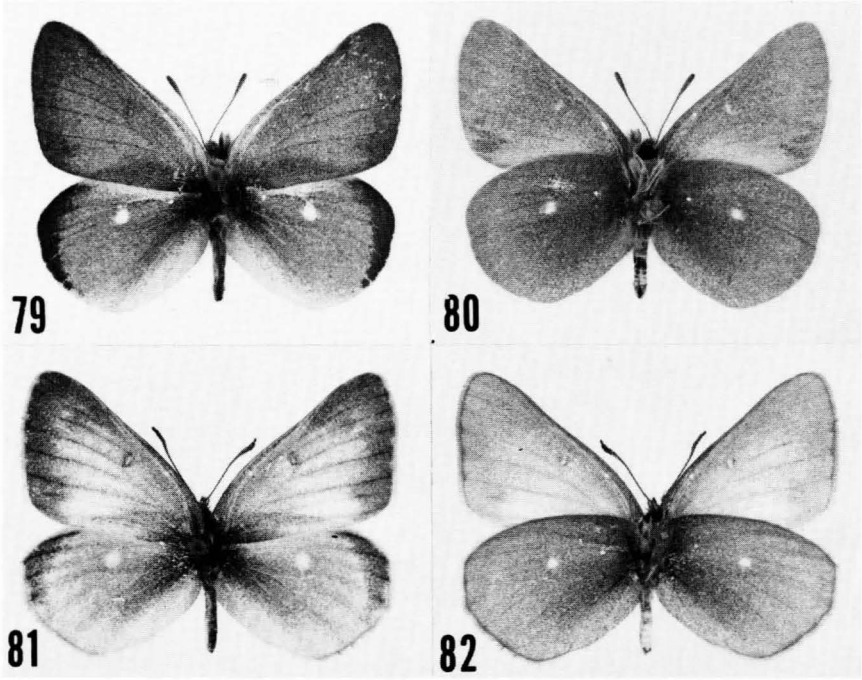
Dr. Scott Shaw of the MCZ, Cambridge, MA kindly permitted me to borrow several Scudder type specimens for examination and photography, and I am most grateful to him. Specimens for retention were supplied by J. A. Ebner, Okauchee, WI; L. P. Grey, Lincoln, ME; J. R. Mori, Modesto, CA; J. S. Nordin, Laramie, WY; J. Reichel, Revelstoke, BC; E. G. Voss, Ann Arbor, MI.

I am indebted to Guy Martin, Village Land Manager, Bering Straits Native Corporation, Nome, AK for arranging for collecting permits for native lands in the Nome vicinity (a joint venture with K. W. Philip and J. and L. Troubridge).

Locality data were generously supplied by: S. J. Kohler, Missoula, MT; P. A. Opler, Ft. Collins, CO (detailed data on the distribution of *C. interior* in the eastern U.S.); J. P. Pelham, Seattle, WN; K. W. Philip, Fairbanks, AK (extensive NW arctic records and access to his collection); J. H. Shepard, Nelson, BC. Dr. J. D. Lafontaine, Biosystematics Research Institute, Ottawa, Ont., Canada made it possible for me to examine material in the Canadian National Collection, and arranged for loan of material for photography. Dr. F. H. Rindge of the American Museum of Natural History arranged for loan material for examination. Dr. R. K. Robbins graciously arranged for photographs of several type specimens in the National Museum of Natural History. N. S. Curtis, Moscow, ID directed me to several collection localities in Idaho. B. E. Nelson of the Rocky Mountain Herbarium, University of Wyoming advised me on botanical nomenclature.

As always, special thanks are due Lee and Jackie Miller for their many kindnesses during my visits to the Allyn Museum of Entomology/Florida State Museum and while a guest in their home, and for making possible publication of this paper.

Prior to submission, this paper was reviewed by Drs. J. C. Burne and J. E. Lloyd of the Department of Entomology, University of Wyoming, and their helpful comments are appreciated.



Figures 79-82. Typical specimens of *Colias behri* from Tioga Pass, Mono Co., CA, leg. J. R. Mori. ♂, 6.viii.70, D (79); same V (80); "alba" ♀, 3.viii.68, D (81); same V (82).



Figure 83. Distribution map for *C. behri* in the Sierra Nevada of California.

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APPENDIX

Collection Records and Material Studied

To conserve space, names of collectors and dates of collection are omitted. As much as possible, place names have been checked for spelling accuracy, but I have not been able to locate all of them, and deciphering of handwritten labels was sometimes difficult. Many old place names associated with specimens in the Canadian National Collection are identified on the maps included in Hockett, 1965:16-19. In addition to material in the author's collection, specimens from the following collections were examined: Allyn Museum of Entomology/Florida State Museum, including the Chermock and Hovanitz collections; American Museum of Natural History; Canadian National Collection; Nelson S. Curtis; K. W. Philip. The Hovanitz *Colias* holdings have recently been transferred from the Allyn Museum of Entomology to the California Academy of Sciences.

Colias interior (1365 specimens). **CANADA. ALBERTA.** Banff N.P.; Banff-Jasper Hwy.; Cypress Hills; Elkwater; nr. Exshaw; Hwy. 43, 9 mi. W. of Fox Creek; Hillcrest; hills E. of Hailstone Butte; Jasper N.P.; Kananaskis Hwy. nr. Plateau Mtn.; Lake Louise; Manyberries; Moose Mtn.; Obed; Waterton Lakes; Waterton N.P.; nr. Wemby (Grand Prairie). **BRITISH COLUMBIA.** Alaska Hwy. mi. 30, 90, 126, 146, 152, 153, 169, 220, 355, 356; Barkerville; Canim Lake; Elko; 10 mi. N. Farquier Ferry on Hwy. 6; Hedley; Jesmond; Kaslo; Kootenay Mtns.; Lac la Hache; Lone Butte, Bridge Ck. Rd.; Kitwanga; Manning Park, various localities; 100 Mile House; 12 mi. S. 100 Mile House; Mt. Apex (Summerland); Osoyoos; Pavilion Mtn., 20 mi. S. of Jesmond; Pink Mtn.; Williams Lake. **LABRADOR.** Goose Bay; Happy Valley NE of Goose Bay. **MANITOBA.** Clear Lake; Grace Lake and Rocky Lake Rds. nr. The Pas; Porcupine Mtns.; Riding Mtns.; Sandilands; The Pas. **NEW BRUNSWICK.** Bartibog; Bathurst; Forestville; Havelock; Légère; Newcastle; Pokemouche; St. John; Tabusintac; Tracadie; Waweig. **NEWFOUNDLAND.** Avalon Pen.; Barachois Prov. Park; Codroy Valley; Doyles; Gander; Hwy. 1 at base of View Hill; New Melbourne; Old Hwy. 430 ca. 10 mi. N. of Hwy. 1; Port aux Basques; St. Anthony; Springdale; Stephenville; Table Mt. Plateau; Woody Point. **NORTHWEST TERRITORIES.** Ft. Smith. **NOVA SCOTIA.** Baddeck (Cape Breton Is.); Big Indian Lake; Digby; Dingwall (Cape Breton Is); Halifax Co.; Halifax watershed; Lundy; Milford; Mooselands; Mt. Niacke; Parrsboro; Petite Rivière; Tory Ck.-Guysboro. **ONTARIO.** Almonte; Black Sturgeon Lake; Capreol; Finland; Massassaca For. Res.; Minski; Nipigon; Ogoki; One Sided Lake; Sault Ste. Marie; Sibley Bay-Thunder Bay; Smoky Falls, Mattagami River; Sudbury River, Wawa. **PRINCE EDWARD IS.** Alberton; Can. N. P.; Dulvay House; Portage. **QUEBEC.** Cascapedia River vic.; Covey Hill; Kazubazua; Luskville; Gaspé Co.; Gatineau Park; Gynaud; Mistassini; Mt. Albert; Natashquan; Park Reserve; Rupert House; Trinity Bay [*sic*, probably a misprint for Newfoundland and not Quebec]. **SASKATCHEWAN.** 45 mi. E. Hudson Bay Jct.; Nipawin Prov. For.; Torch River. **UNITED STATES. IDAHO.** Bonner Co.: 4 Corners Rd. Boundary Co.: Good Grief; Meadow Ck. Rd. nr. Moyie Springs; Hwy. 2, 3 mi. W. Montana border. Kootenai Co.:

nr. Spirit Lake. Nez Perce Co.: Craig Mts. Shoshone Co.: Pine Ck.; Uranus Peak; Wallace. **MAINE**. Penobscot Co.: Chester; Cold Steam Bog; Enfield; Lincoln; S. Lincoln; Millinocket; Passadumkeag. Piscataquis Co.: Mt. Katahdin, Sagadahoc Co.: Popham Beach. **MICHIGAN**. Cheboygan Co.: (no additional data). Montmorency Co.: Atalanta. Oscoda Co.: Little Wolf Lake. Roscommon Co.: St. Helen. Schoolcraft Co.: Little Wolf Lake; "Ramona". **MINNESOTA**. Lake Co.: McNair. St. Louis Co.: Ash River Trail. **MONTANA**. Flathead Co.: Btwn. Eureka and Whitefish; Kootenai Divide, W. of Olney. Missoula Co.: Bitterroot Mts., St. Regis Ck.; Little Bitterroot Lake and E. McGregor Lake; Swan River-Clearwater River divide. **OREGON**. Deschutes Co. Douglas Co.: Diamond Lake. Grant Co. Jefferson Co.: Camp Sherman. Union Co. **VERMONT**. Windsor Co.: Okemo Mtn. **WASHINGTON**. Ferry Co.: 5-15 mi. W. of Kettle Falls. Mason Co.: Flapjack Lake. Okanogan Co.: Boulder Lake; Brewster; Satus Pass; Tiffany Ck.; Tiffany L. Stevens Co.: nr. Colville. **WEST VIRGINIA**. Randolph Co.: Roaring Plains. **WISCONSIN**. Chippewa Co. Florence Co.: Fern. Monroe Co.: 2.6 mi. W. of Mather. Oneida Co. Dates: 20.vi-6.viii.; most records are for mid-vii.

Colias pelidne pelidne (587 specimens). **LABRADOR**. Cartwright; Hebron; Hopedale; Nain; Nutak. [**MANITOBA**. There are 3 males labeled "Ft. Churchill, 26.v.52, P. R. Ehrlich" in the Canadian National Collection. These are presumed to be mislabeled since butterflies generally do not occur at Churchill until the end of June.] **NEWFOUNDLAND**. Doctor's Hills; Hwy. 1, 2.8 mi. SW Mummichog Park; Mummichog Park; St. Anthony; Table Mtn. Plateau nr. Cape Ray. **QUEBEC**. Bradore Bay; Ft. Chimo; George River, E. Hudson Bay; Gr. Whale River; Indian House Lake; Knob Lake; Natashquan; Payne Bay; Port Harrison (Inoucdjouac). **YUKON TERRITORY**. Demspster Hwy., km. 80, 97, 154-155 at Windy Pass, Ogilvie Mtns. (misidentified by Ferris in Ferris *et al.*, 1983:829 as *C. pelidne minisni*). Dates: 26.v(?) - 31.vii.

Colias pelidne skinneri (149 specimens). **CANADA**. **ALBERTA**. Kananaskis-Highwood Summit; Banff N.P.: Lake Louise; Nigel Cr. Trail; Nigel Pass, Peyto Lake; Jasper N.P.; Bow Pass; Mt. Assiniboine; Mt. O'Brein [*sic*]. **SASKATCHEWAN**. (No additional data; specimen in AME/FSM and perhaps mislabeled).

UNITED STATES. **IDAHO**. Blaine Co.: Alturas Mt. Boise Co.: Deer Park, Boise River. Fremont Co.: Sawtell Mtn. Rd. Idaho Co.: Hwy. 12 at Lolo Pass. Lemhi Co.: Bannock Pass; Lost Trail Pass. Shoshone Co.: Pine Ck. **MONTANA**. Carbon Co.: Glacier Lake Rd. Cascade Co.: Little Belt Mtns. Meagher Co.: King's Hill. Park Co.: NE entr. Yellowstone N.P. Ravalli Co.: Bass Ck.; Lost Trail Pass. **WYOMING**. Big Horn Co.: Medicine Wheel Pass. Fremont Co.: nr. Brooks Lake; Canyon Ck. bog; Shoshone Nat. For. Johnson Co.: Cloud Peak Wilderness; Hwy. 16, M.P.60. Lincoln Co.: Commissary Ridge; Cottonwood Lake; Red Top Ck.; Swift Ck. Sheridan Co.: Hwy. 14, 7 mi. E. of Burgess Jct. Sublette Co.: Doubletop Mtn. Trail, Bridger Wilderness; Faler Ck.; Elkhart Park; Long Lake Trail, Bridger Wilderness; Palmer Lake. Teton Co.: Grand Teton N.P.; Jackson Hole; Timber Island. Yellowstone N.P. Dates; 9.vii-11.viii. This species is most common in late vii.

Colias palaeno chippewa 1654 specimens). **ALBERTA**. Hwy. 2, 35 mi. S. of Dawson Ck. **BRITISH COLUMBIA**. Alaska Hwy. mi. 168, 169, 176, 250, 265, 400, 415, 426, 450, Summit Lake; Chilkat Pass; ca. 25 mi. S. Kamloops (CNC specimen, probably an erroneous locality label); Pink Mtn. summit. **MANITOBA**. Churchill; Ft. Churchill; Gillam; H.B.R.R. mi. 214, 240, 314, 327, 332, 506.5; Kelsey Dam, Nelson River. **NORTHWEST TERRITORIES**. Aklavik; Baker Lake; Bathurst Inlet; Beechy Lake; Caribou Rapids, Cameron River; Caribou Rapids, Hanbury Lake; Caribou xing, Gr. Slave Lake; Coppermine; Eskimo Point; Ft. Franklin; Geillini Lake, Great Bear Lake, Cameron Bay; Hanbury River; Inuvik; Maguse Lake; Muskox Lake; Norman Wells; Padley; Reindeer Depot; Selkirk Mtns. at Canol Rd.; Schultz Lake rapids; Thelan Sanctuary; W. branch of Tilam River; Yellowknife. **YUKON TERRITORY**, Alaska Hwy. Mi. 1053-1300, numerous records; mi. 100 Canol Rd.; 10 mi. S. Burwash Landing (Kluane Lake); Dawson; Dry Creek; Firth River, British Mtns.; Dempster Hwy. km. 29, 40, 82, 84, 140.5, 155, 416, 465; Duncan Ck. Rd.; vic. Haines Jct.; Hansen Lake Rd. 1 km from jct. Hwy. 11; Hwy. 11 km 31.5 W. of Mayo; Johnson xing. of Canol Rd.; Klondike Pass; Kluane Lake; Ladue River; La Force Lake; Mush Lake; Otter Lake; Pelly River; Rampart House; Sam Lake; Sheldon Lake; Stewart

River; Swim Lakes; S. of Tetlin Lake; mi. 55, 60 Mile Rd.; Watson Lake; Whitehorse; 50 mi. W. of Whitehorse, Kluane Rd. **ALASKA**. Alaska Hwy. mi. 1195, 1247, 1309; Anchorage; W. side Darby Mtns., Seward Pen., from Omilak R. to Dry Ck. and Omilak airstrip; Denali Hwy. mi. 32, 105, 145; Glenn Hwy. Sheep Mtn., mi. 117.275; King Salmon; McKinley N.P., mi. 5.6 Park Hwy., Highway Pass; Moose Pass, Kenai Pen.; Murphy Dome N. of Fairbanks; Nome area including Council Rd., Glacier Rd., Kougarok Rd., and Teller Rd.; Richardson Hwy. mi. 19.5, 206 (Isabel Pass), 240, 244, 250; Steese Hwy. mi. 69, 95, 97, 111, 119.3; Taylor Hwy. mi. 3.6; Umiat; Unalakleet. Dates: 28.vi-10.viii.

Colias palaeno baffinensis (195 specimens). **NORTHWEST TERRITORIES**. Baffin Is.: Frobisher Bay; Lake Harbour; Ponungnituk (*sic*, assumed to be a misspelling of Pangnirtung). Dates: 3.vii-19.viii.

Colias behri (47 specimens). **CALIFORNIA**. Mono Co.: Mammoth Lakes; Tioga Pass; Tolumne Meadows; Yosemite Mtns. Dates: 13.vii-31.viii.

Additional Locality Data — Specimens Not Examined

Colias interior. **CANADA**. **BRITISH COLUMBIA**. Alaska Hwy. mi. 140; ?Atlin (this is most probably a misidentification of *gigantea* Strecker); Garibaldi N.P.; Hazelton; Lytton; Mt. Big White, Okanogan Valley; Mt. McLean; Rosslund; Ymir. **LABRADOR**. Cartwright; Hebron (this is undoubtedly a misidentification of *pelidne*). **MANITOBA**. H.B.R.R. mi. 200; Lynn Lake. **NEWFOUNDLAND**. Coal Brook; Cormack; Corner Brook; Cupids; Doctor's Hills; Flower's Cove; Gaff Topsail; Glenburnie; Glenwood; Kitty's Brook; Lethbridge; Millertown Jct.; North River; Peter's River; Port de Grave; St. John's; Table Mountain; The Tolt; Winterland; Witless Bay. **ONTARIO**. Armstrong; Big Piskwanish; Cartier; Charlton; Favourable Lake; Fraserdale; Geraldton; 65 mi. W. of Hearst; Hornepayne; Ignace; Inwood Park; Longbow Corners; Low Bush; Malachi; Minaki; Moose Factory; Moosonee; Nakina; Oba; Onakawana; One Sided Lake; Quetico Park; Shanley Township; Timagami; Westree; White River. **SASKATCHEWAN**. Cypress Hills; Loon Lake; Price Albert; Somme.

UNITED STATES. **IDAHO**. Bonner Co.: Gold Ck. Rd., 11 mi. E. Colburn. Boundary Co.: Bond Lake Rd., 1.1 mi. W. Hwy. 95; jct. Herman Lake Rd. and Hwy. 2; 3 mi. S. Meadow Ck. CG., nr. Moyie Springs, Kootenai Co.: Bunco Ck. Rd., 4 mi. SW Farragut St. Pk.; 0.5 mi. S. Farragut St. Pk. **MAINE**. Franklin Co.: Rangeley; Weld. Kennebec Co.: Augusta. Knox Co.: Hope. Waldo Co.: Ilesboro. **MONTANA**. Beaverhead Co.: Polaris. Deer Lodge Co.: Flint Ck., Discovery Basin Rd. Flathead Co.: Apgar; Bowman Lake, Glacier N.P.; Camas and Ditch Ck.; 1 km S. Huckleberry L.O., Apgar Mtns.; Kootenai Divide; 2 mi. NW of Little Bitterroot Lake turnoff nr. Marion; McGee Meadow, 11 mi. NW Glacier; 2 mi. E. McGregor Lake; Trail Ck. Flathead-Glacier Co.: Glacier N.P. Gallatin Co.: W. Gallatin. Glacier Co.: 7 mi. NW Babb. Railroad Ck., E. of Firebrand Pass. Granite Co.: Skalkaho Pass. Jefferson Co. Lake Co.: Flathead Lake; Simmons Meadows, Swan River State Forest; Yellow Bay. Lewis and Clark Co.: nr. Lincoln; MacDonald Pass. Lincoln Co.: W. Fisher Riv. rd.; 10 mi. W. of Happy's Inn; Meadow Peak L.O. Rd., E. Happy's Inn. Madison Co.: Lyon. Mineral Co.: Hwy. 10A, 5.1 mi. E. MT-ID state line; 3 mi. SE. DeBorgia; 4.3 mi. E. of Lookout Pass; Randolph Ck. nr. Mullan Pass; nr. St. Regis. Missoula Co.: 9-Mile Ck., nr. Stark; Butler Ck. off 9-Mile Ck. Rd.; 2 mi. N. of Condon; Cottonwood Lakes, E. of Seeley Lake; Elk Meadows Rd., 30 mi. S. of Lolo; Pattee Canyon; 16 mi. N. of Seeley Lake; Seeley Lake; Twin Creek, 10 mi. E. of Bonner. Pondera Co.: Pike Ck. Rd. Powell Co.: 4-6 mi. SE Elliston. Ravalli Co.: Bass Ck., nr. Florence; 8-Mile Ck., nr. Florence. Sanders Co.: Baldy Mtn. nr. Plains. Yellowstone Co. **VIRGINIA**. Highland Co.: Middle Mountain. **WASHINGTON**. Okanogan Co.: Rogers Lake.

Colias pelidne pelidne. **LABRADOR**. Black Island; Davis Inlet; Knob Hill; Okak. **NEWFOUNDLAND**. Burnt Island; Doyley; Flower's Cove; L'Anse au Clair; Port aux Basques; St. John's; St. John Island; The Tolt. The following records have appeared in the Annual Summaries in the NEWS of the Lepidopterists' Society: **ALASKA**; (1981) Alaska Hwy. 23 mi. N. of Delta; (1981) Taylor Hwy., Mosquito Fk. to Chicken Ck.; (1964) Index Lake area; (1964) Palmer. **NORTHWEST TERRITORIES**: (1976) Frobisher Bay,

Baffin Is. **ONTARIO**. Cape Henrietta Maria; Ft. Albany; Moose Factory. **YUKON TERRITORIES**: (1969) Haines Jct. vic.; (1971) Mayo Lake/Kino; (1975) Whitehorse; (1966) SW Yukon Terr. I suspect that most, if not all, of these records are misidentifications of other *Colias* species such as *gigantea* (small individuals), *palaeno* or *philodice vitabunda* (small individuals with reduced ventral maculation). I have seen no specimens of *pelidne* from Alaska, and this species is decidedly uncommon in the Yukon Territory.

Colias pelidne skinneri. **CANADA. BRITISH COLUMBIA**. Glacier N.P., Purcell Mtns.; Paradise Mine Camp; Yoho Valley nr. Field.

UNITED STATES. IDAHO. Adams Co.: Hwy. 15, 4 mi. W. of McCall. Fremont Co.: 7.9 mi. E. of Mack's Inn. Idaho Co.: Graves Pk. Trail; Hwy. 12, 8.5 mi. E. of Lochsa Lodge. Lemhi Co.: 8 mi. Ck. CG, 10 mi. W. of Leadore; Meadow Creek Lake, 4 mi. W. of Gilmore. **MONTANA**. Beaverhead Co.: Pass Ck. Rd. 5 mi. W. of Polaris; Polaris. Cascade Co.: Kings Hill; S. of Monarch; Neihart. Deer Lodge Co.: Storm Lake Rd. nr. Georgetown Lake. Gallatin Co.: Gallatin Canyon. Glacier Co.: Two Medicine, Glacier N.P. Granite Co.: Skalkaho Pass and 2 mi. E. Lewis and Clark Co.: MacDonald Pass. Missoula Co.: Elk Meadows, 30 mi. SW Lolo; Lolo Summit; Twin Ck., 10 mi. E. of Bonner. Powell Co.: 4-6 mi. SE of Elliston; Rock Ck. Lake. Ravalli Co.: Bass Ck.; nr. Twin Lakes, Lost Horse Rd., 15-20 mi. NW Darby; nr. Skalkaho Pass; Woods Ck. Rd. and Horse Ck. Pass S. of Painted Rocks Lake. Stillwater Co.: Rosebud Valley, Beartooth Range. Sweet Grass Co.: Big Timber Canyon.

Colias palaeno chippewa. **BRITISH COLUMBIA**. Alaska Hwy. mi. 150, 379-449; Atlin, Slate Ck.; Monarch Mtn., 4500'. **LABRADOR**. Old literature records; no contemporary records. **NORTHWEST TERRITORIES**: Anderson Riv. delta; Chesterfield Inlet; Chick Lake, ca. 50 mi. N. Norman Wells; Godlin Lakes, Mackenzie Mtns.; Inuvik; Tuktoyaktuk; Tununuk Point. Victoria Is. **ONTARIO**. Ft. Severn; Lansdowne House. **QUEBEC**. Ft. Chimo. **SASKATCHEWAN**. Black Lake; Hasbala Lake; Stony Rapids. **YUKON TERRITORY**. Alaska Hwy. mi. 1053-1090, 1152, 1180; British Mtns., 69°30'N, 140°47'W; Dempster Hwy. km 82.5, 114.5-117.5, 491; Eagle Plains; Elsa/Kino; Firth Riv.; Firth Riv. at Sheep Ck.; Haines Cutoff, mi. 99; Haines Hwy., mi. 154; Haines Jct. vic.; Klondike Hwy. mi. 89, 132; Klondike Loop Hwy., 5 mi. up Clinton Ck. access rd.; Kluane Lake region incl. Bear Ck. Pass, Destruction Bay, Mt. Decoeli, Nickel Ck.; Mayo Lake; Montana Mtn., S. of Carcross; Mt. Fitton; Mt. Sedgwick; Ogilvie Mtns. along Dempster Hwy.; Old Crow; Richardson Mtns. along Dempster Hwy.

ALASKA. ALASKA RANGE: mtns. W. of Donnelly; 6-11 mi. SW of Farewell; vic. Healy; vic. Kantishna; Lone Mountain, 40 mi. W. of Farewell; Maclaren Riv. at Denali Hwy.; Maclaren Summit on Denali Hwy.; Wood River. **BROOKS RANGE**: hdwtrs. of Alatna Riv.; Anaktuvuk Pass; Arrigetch Ck., Arrigetch Peaks; N. side Atigun Gorge. Dalton Hwy.; hdwtrs. of Canning Riv.; Chandalar Shelf, S. of Atigun Pass; vic. Egiklak Mtn.; Galbraith Lake; 5 mi. NE Howard Pass, E. of Etivluk Riv.; Iniakuk Lake E. of Alatna Riv.; Itigaknit Mtn.; hdwtrs. of Kivalina Riv., Wulik Peaks, DeLong Mtns.; Lake Amitchiak, 23 mi. SE Howard Pass; Lake Schrader and Lake Peters; McCall Glacier; Nuturwik Ck., Dalton Hwy.; Wulik Riv., 68°05'-10'N, 162°55'-163°30'W. **INTERIOR**: Bettles Field; Big Lake, 22 mi. WNW Wiseman; vic. Circle, incl. Circle Hot Spgs.; Dalton Hwy., 37.3 mi. N. of Yukon Riv.; Delta Jct.; Ester Dome; Fairbanks and vicinity including Goldstream Valley; Fish Ck.; Kobuk Riv. nr. mouth of Ambler Riv.; Kuskokwim Mtns., vic. Ophir, Takotna, Beaver Mtns., also vic. Iditarod; Lake Minchumina; McGrath; Murphy Dome; Nikolai; Ray Mtns., btwn. Torment Ck. and Tozitna Riv.; mi. 332 Richardson Hwy.; Rustic Village; S. Fk. 40 mi. Riv., 64°04'-05'N, 141°46'-54'W; Sheenjek Riv.; Steese Hwy., mi. 53.5, 90.2, 97.2, 102, 119, 137, 153, Eagle Summit, 12 mi. Summit; Taylor Hwy., Mt. Fairplay, Mosquito Fork to Chicken Ck.; Tetlin. **NORTH SLOPE**: Barrow (1958 record from Paul Hurd, but species is doubtful as a permanent resident); Colville Riv. delta; Itkillik Riv., SE of Umiat; Kavik Riv., 69°40'N; Meade Riv., Atkasook; Noluck Lake; Okpilak Riv., 69°45'-70°03'N, 143°42'-47'W; Sagavanirtok Riv. above Sagwon; Toolik Lake; Umiat. **NORTHWESTERN**: Noatak Riv. Valley; Ogotoruk Ck. **SOUTHCENTRAL**: Beluga, NW side Cook Inlet; Chugach Park boundary just E. of Anchorage; Crow Pass trail N. of Girdwood; Denali Hwy. mi. 11-14, 34-40, 77, 81.4, 125 vic. Cantwell; Glenn Hwy. mi. 76,

86, 113-121; Glennallen; Gulkana Riv., 10 mi. above W. Fk.; Hatcher Pass, Talkeetna Mtns.; Index Lake; Lazy Mtn.; Lazy/Red Mtns.; Manker Ck., Chugach Mts, E. Klutina Lake; Mentasta Mtns., 30 mi. S. Tok Jct.; Tangel Lakes; Wrangel Mtns., SW flank incl. Cheshnina, Chetaslina, Dadina Rivers. SEWARD PENINSULA: Buckland/Elephant Point; Cape Espenberg; Harris Dome vic.; Imuruk Lake; Kigluaik Mtns.; 64°50'N. 165°42-59'W; Kitluk Riv., 66°32-35'N, 164°22-26'W; Kougarok Rd. mi. 26-29, 40, 50; Lava Lake; Mt. Distin; Nome and vic.; Penny Riv. 0-4 mi. N. Teller Rd.; Serpentine Hot Spgs.; Shishmaref vic., mouth of Arctic Riv.; Teller Rd. mi. 18, 21, 28; Willow Bay E. of Deering. SOUTHWESTERN: Agulowak Riv. and Bumyok Ridge, Wood River Lake; Iliamna Village, N. side Lake Iliamna; King Salmon; Newtok, Baird Inlet; Old Chevak; Shageluk. KENAI PENINSULA: Bear Cove, Kachemak Bay; nr. Cooper Landing. KODIAK IS.: Kodiak, 20.vii (Harriman Alaska Expedition of 1899).

Colias behri. CALIFORNIA. No county listed; YNP = Yosemite Nat. Park (from Garth & Tilden, 1963:87). Crest W. of Tioga Pass; E. of Donahue Pass; Elizabeth Lake, Cathedral Range; Lake above Lewis Ck. Trail, YNP; Helen Lake, E. of Kuna Crest; Kerrick Meadows region, YNP; Kuna Crest area, YNP; Merced Lake Trail; Mineral King; Pilot Peak; Rafferty Creek; Rock Creek; Tioga Pass; Tuolumne Meadows; Upper Gaylor Lake.

Locality Data by State and County or Province

The data presented below summarize the information from above and additional information from regional checklists and private collectors.

Colias interior. ALBERTA. BRITISH COLUMBIA. LABRADOR. MANITOBA. NEW BRUNSWICK. NEWFOUNDLAND. NORTHWEST TERRITORIES. NOVA SCOTIA (including CAPE BRETON IS.). ONTARIO. PRINCE EDWARD IS. QUEBEC. SASKATCHEWAN.

IDAHO. Bonner, Boundary, Clearwater, Idaho, Kootenai, Latah, Lemhi, Shoshone, Valley. MAINE. Aroostook, Cumberland, Franklin, Hancock, Kennebec, Knox, Lincoln, Oxford, Penobscot, Piscataquis, Sagadahoc, Waldo, Washington, York. MARYLAND. Garrett. MICHIGAN. Alger, Alpena, Antrim, Baraga, Benzie, Charlevoix, Cheboygan, Chippewa, Clare, Crawford, Delta, Dickinson, Emmet, Gogebic, Houghton, Ingham, Iosco, Kalkaska, Keweenaw, Lake, Luce, Mackinac, Marquette, Mason, Montmorency, Newaygo, Oakland, Ontonagon, Oscoda, Otsego, Ottawa, Presque Isle, Schoolcraft, Washtenau. MINNESOTA. Aitkin, Beltrami, Carlton, Cass, Clearwater, Cook, Crow Wing, Dakota, Itasca, Koochiching, Lake, Lake of the Woods, Pine, Roseau, St. Louis. MONTANA. Beaverhead, Flathead, Gallatin, Glacier, Granite, Jefferson, Lake, Lewis and Clark, Lincoln, Madison, Mineral, Missoula, Pondera, Powell, Ravalli, Sanders, Yellowstone. NEW HAMPSHIRE. Coos, Grafton. NEW YORK. Clinton, Essex, Franklin, Hamilton, Herkimer, Lewis, St. Lawrence. OHIO. ?Seneca. OREGON. Baker, Deschutes, Douglas, Jefferson, Klamath, Morrow, Umatilla, Wallowa, Wasco. PENNSYLVANIA. Tioga. VERMONT. Rutland, Windham, Windsor. VIRGINIA. Highland. WASHINGTON. Chelan, Ferry, ?Klickitat, Okanogan, Pend Oreille, Stevens, Whatcom, ?Yakima. WEST VIRGINIA. Pendleton, Pocahontas, Randolph, Tucker. WISCONSIN. Brown, Burnett, Chippewa, Door, Douglas, Eau Claire, Florence, Forest, Iron, Jackson, Juneau, Marathon, Marinette, Monroe, Oconto, Oneida, Portage, Rusk, Sawyer, Sheboygan, Vilas, Waushara, Wood.

Colias pelidne pelidne. LABRADOR. ?MANITOBA. NEWFOUNDLAND. ?NORTHWEST TERRITORIES. ONTARIO, QUEBEC. YUKON TERRITORY. ?ALASKA.

Colias pelidne skinneri. ALBERTA. BRITISH COLUMBIA. SASKATCHEWAN.

IDAHO. Adams, Bannock, ?Bear Lake, Blaine, Bingham, Butte, Clark, Clearwater, Custer, Fremont, Idaho, Kootenai, Lemhi, Valley. MONTANA. Beaverhead, Carbon, Cascade, Deer Lodge, Flathead, Gallatin, Glacier, Granite, Jefferson, Lewis and Clark, Meagher, Missoula, Powell, Ravalli, Stillwater, Sweet Grass. OREGON. ?Baker, Wallowa. WYOMING: Big Horn, Fremont, Johnson, Lincoln, Park, Sheridan, Sublette, Teton, Yellowstone N.P.

Colias palaeno baffinensis. NORTHWEST TERRITORIES. Baffin Is.

Colias palaeno chippewa. ALBERTA. BRITISH COLUMBIA. LABRADOR. Old records only. MANITOBA. NORTHWEST TERRITORIES. ONTARIO. QUEBEC. SASKATCHEWAN. YUKON TERRITORY. Found essentially throughout the entire territory. ALASKA. Found virtually over the entire state excepting the SE panhandle region.

Colias behri. CALIFORNIA. Inyo, Mono, Tulare, Tuolumne.

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