

CALLOPHRYS NIPHON (LYCAENIDAE) IN ALBERTA
WITH NOTES ON THE IDENTIFICATION OF
C. NIPHON AND *C. ERYPHON*

JAMES D. REIST¹

Department of Zoology, University of Alberta, Edmonton, Alberta, Canada, T6G 2E9

ABSTRACT. The known range of *Callophrys niphon clarki* is extended 185 miles west into the province of Alberta, Canada with the capture of several specimens in May 1977 and May 1978.

Atypical specimens of *Callophrys eryphon eryphon*, a species closely related to *C. niphon*, possess a mid-cell and an end of discal cell bar thus invalidating an important character heavily relied upon for identifying these butterflies. Some atypical specimens of *C. niphon* have a smeared or rarely absent mid-cell bar. Alberta *C. niphon* show great variation in other characters including those used for identification purposes in keys of major works. Thus, extreme caution is warranted when identifying these two species using existing taxonomic and descriptive literature.

On the basis of identification of two specimens confirmed by Dr. C. D. Bird and three additional specimens (of poorer quality) confirmed by Mr. J. D. Lafontaine, *Callophrys (Incisalia) niphon clarki* (Freeman) is herein reported to occur in jackpine woods in central Alberta (54°5'N, 113°50'W) (Figs. 1 and 2).

Hooper (1973) reports the northwestern range of *C. niphon clarki* to be "the Loon Lake area," Saskatchewan (about 35 miles east of the Alberta-Saskatchewan border at 54°N). Other references to the western range list it simply as southern Manitoba (Brown, 1957; Clench, 1961; Howe, 1975).

The initial collection consists of two specimens in good condition taken along a cutline in a jackpine wood 7½ mi east and 2½ mi south of Clyde, Alberta on 7 May 1977. The immediate topography consists of low rolling hills with a shallow dip to the west. The elevation of the area is approximately 2,100 ft. Vegetation is almost totally jackpine (*Pinus banksiana*) with sparse, low shrub and herbaceous undergrowth. Aspen poplar (*Populus tremuloides*) and shrubs such as saskatoon (*Amelanchier alnifolia*) and rose (*Rosa* sp.) have regenerated along road allowances, cutlines and occasional clearings. *Callophrys augustinus augustinus* (Westwood) and *Callophrys polios obscurus* Ferris and Fisher were also taken at this time.

On 4 June 1977 five additional specimens of *C. niphon*, in poor condition were collected at West Bridges Lake, 2¼ mi north and 6½ mi east of Clyde. This site is approximately 5 mi NNW of the first collection area and in the same type of topography and vegetation

¹ Current address: Department of Ichthyology and Herpetology, Royal Ontario Museum, 100 Queen's Park, Toronto, Ontario, Canada, M5S 2C6.

community. These specimens were all taken on a moist, sandy beach on the west side of the lake. The immediate vegetation was an aspen poplar-shrub wood bordering the lake for about 200 yards before giving way to a jackpine community such as described above. *C. polios* was also taken here.

One additional worn specimen was taken by Mr. T. W. Thormin on 6 June 1977 six mi east of Redwater, Alberta; that is, 22 mi SE of the first collection site.

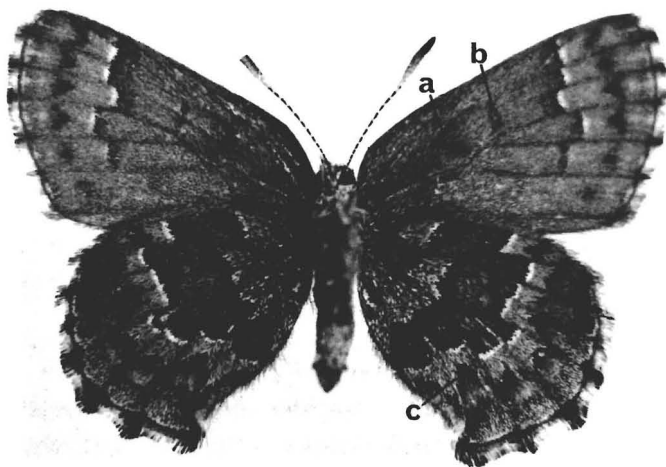
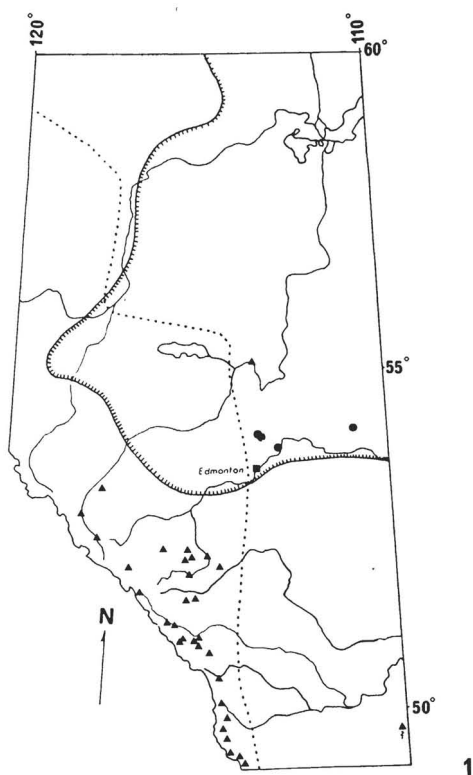
On 6 May 1978 three specimens of *C. niphon* were taken at the first site. On 7 and 13 May 1978 many additional (about 40) specimens were taken in the jackpine wood on the west side of West Bridges Lake. Both sexes were in flight but oviposition was not observed. *C. polios* and *C. augustinus* were flying at both sites as well. T. W. Thormin took several *C. niphon* near Bonnyville, Alberta on 28 May 1978.

Fig. 1 shows the known localities, to date, of *C. niphon clarki* in Alberta. The widespread occurrence of *C. niphon*, both in space and time, suggests this species is well established in the province probably as a breeding population(s). Jackpine, preferred foodplant of *C. niphon*, is found over large areas of central east and northeastern Alberta (Fig. 1); thus additional collecting in these areas may greatly extend our knowledge of the provincial range of this species. The collections herein reported extend the known range of *C. niphon clarki* approximately 185 mi further west than previously determined (Hooper, 1973).

Fig. 1 also shows the Alberta distribution of *Callophrys (Incisalia) eryphon eryphon* (Boisduval), a closely related congener of *C. niphon*. The preferred foodplant of *C. eryphon* (*Pinus contorta*—lodgepole pine) occurs primarily in montane and submontane areas of western Alberta. However, lodgepole pine and jackpine distributions overlap considerably in central Alberta. This raises the possibility of sympatry of these two butterflies in Alberta. With sympatry comes the possibility of confusion in identification and the potential for hybridization. The remainder of this paper will address the first of these possibilities.

IDENTIFICATION OF *C. eryphon* AND *C. niphon*

Identification of the initial *C. niphon* specimens proved to be difficult using the available literature. Examination of six specimens of both *C. niphon* and *C. eryphon* from the Biosystematics Research Institute, the *C. eryphon* collections of both the University of Alberta and University of Calgary, and a consideration of the 1978 Alberta *C. niphon* showed that the characters commonly used for identification



FIGS. 1, 2. 1, Outline map of Alberta, Canada showing known localities of *Callophrys eryphon eryphon* (triangles) (C. D. Bird, pers. comm.) and *C. niphon clarki* (closed circles). Also shown are the eastern limits of *Pinus contorta latifolia* (dotted line) and western and southern limits of *Pinus banksiana* (toothed line) (both after

are not constant in specimens from different areas. Variation commonly is towards the other species, leading Brown (1957) to question the validity of two species.

Most authors use three characters for identification: presence of both a mid-cell and end of cell dark bar transversely crossing the discal cell on the underside of the forewing in *C. niphon* (a and b in Figs. 2 and 4), while typical *C. eryphon* lack the mid-cell bar (Fig. 3), (Clench, 1961; Hooper, 1973; Howe, 1975). The submarginal dark chevrons on the underside of the hindwing in *C. niphon* are shallowly angled compared to the same on *C. eryphon* (c in Figs. 2 and 3), (Brown, 1957; Clench, 1961; Hooper, 1973; Howe, 1975). *C. niphon* also has more gray scaling on the submarginal line of the underside hindwing than does *C. eryphon* (Brown, 1957; Clench, 1961; Hooper, 1973). These latter two characters show considerable individual variation as well as being dependent upon specimen condition, consequently their usefulness for identification is limited and prone to subjective interpretation.

Presence or absence of the mid-cell discal bar is perhaps the most heavily relied upon distinguishing character used in keys and/or regional works. However, no mention of variability of this character is made.

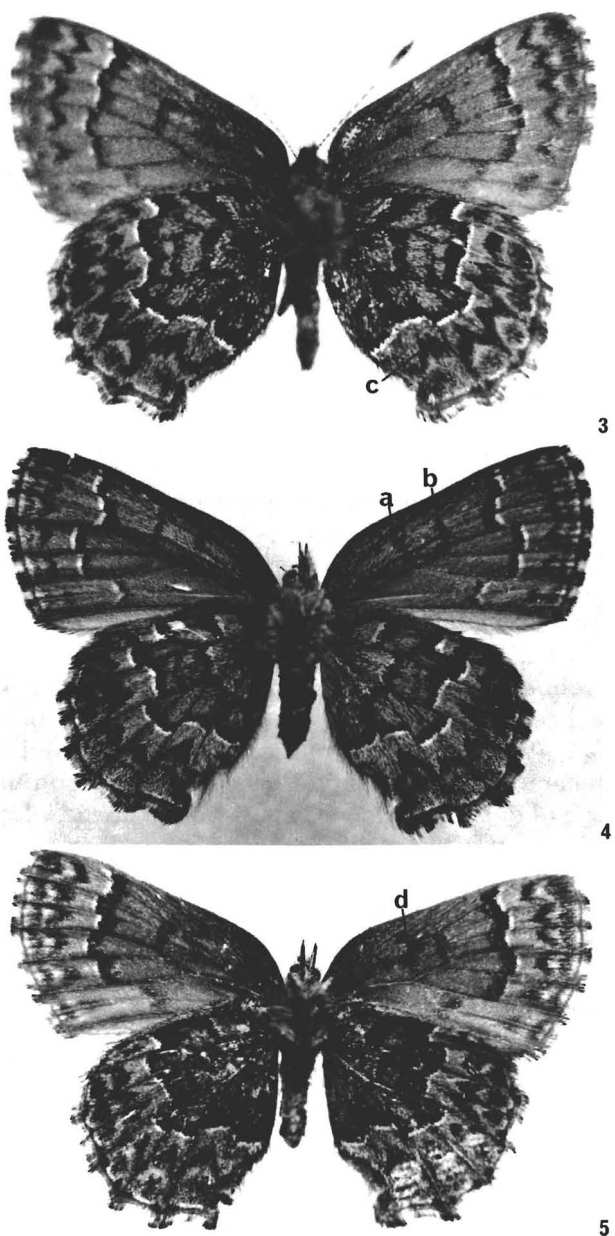
Some specimens of *C. eryphon* possessed a distinct or variously smeared mid-cell bar (d in Fig. 5). Of 41 specimens of *C. eryphon* examined 7 (17%) possessed a mid-cell bar or spot and 5(12%) had that area smeared by dark scaling thus negating determination. Geographic range of these specimens varied from British Columbia to the Northwest Territories but most (36) were from Alberta.

The mid-cell bar, typically present in *C. niphon* was smeared or rarely absent. Fifty specimens were examined (49 Alberta) and 3 (6%) had the bar absent while 9 (18%) had that area smeared or obscured. Extreme variation of other characters including wing checkering; angle of fore- and hindwing chevrons; shape of median bands; hindwing crennation; and most especially color of markings, distribution of gray scaling and ground color was quite evident in the sample of Alberta *C. niphon*. It is unknown whether such variation is typical of the species in other parts of its range. Enumeration and description of this variability of *C. niphon* is intended in a later paper.

In conclusion, when using available literature to key or identify

←

Moss, 1949). Question mark indicates an unconfirmed locality for *C. eryphon*. **2**, *Callophrys niphon clarki* from Clyde, Alberta taken on 7 May 1978. ×5, a, b, c explained in text.



FIGS. 3-5. **3**, *Callophrys eryphon eryphon* from Seebe, Alberta taken on 21 May 1978 (typical form with single discal cell bar). **4**, *Callophrys niphon clarki* from English River, Ontario taken on 17 February 1965. **5**, *Callophrys eryphon eryphon* from Terrace, British Columbia taken on 3 June 1960 (atypical form with two discal cell bars). $\times 5$, a-d explained in text.

suspected specimens of *C. eryphon* or *C. niphon* care should be exercised. Comparison with long series of each species is desirable; and recognition that character variability could potentially lead to erroneous identifications is necessary.

ACKNOWLEDGMENTS

I thank Dr. C. D. Bird (University of Calgary, Calgary, Alberta) and Mr. J. D. Lafontaine (Biosystematics Research Institute, Ottawa) for confirming the identification of *C. niphon clarki*. Mr. Lafontaine kindly arranged for the loan of specimens from the Biosystematics Institute collection. Mr. T. W. Thormin pointed out the lack of Alberta records for *C. niphon* and allowed me access to his collection. Dr. Bird and Extension Entomology, University of Alberta allowed access to collections in their care. Dr. Bird criticized early versions of the manuscript and provided distribution records for Alberta *C. eryphon*. Dr. D. Barr (Royal Ontario Museum, Toronto) criticized a later version of the manuscript. The manuscript was typed by ROM staff.

LITERATURE CITED

- BROWN, F. M. 1957. Colorado butterflies. Denver Museum of Natural History, Denver, 368 p.
- CLENCH, H. K. 1961. Tribe Theclini in Ehrlich, P. R. and A. H. Ehrlich. How to know the Butterflies. Wm. C. Brown Co., Dubuque, Iowa, 262 p.
- HOOPER, R. R. 1973. The butterflies of Saskatchewan. Museum of Natural History, Regina, Saskatchewan, 216 p.
- HOWE, W. H. 1975. The butterflies of North America. Doubleday and Co., Garden City, New York, 633 p.
- MOSS, E. H. 1949. Natural pine hybrids in Alberta. Can. J. Research (c) 27: 218-229.

ADDENDUM

Additional specimens of *Callophrys niphon clarki* from Alberta have recently been identified by Dr. C. D. Bird. These specimens represent a northward extension of the known range within the province of approximately 400 miles and a first record for the species from the Northwest Territories. The collection data are as follows:

a) Pine Lake, Wood Buffalo National Park, Alberta: 59°34'N, 112°15'W, 1 June 1974 (1 specimen); 6 June 1976 (1 specimen), Elsie Kuyt, lakeshore, sandy with scattered willow and aspen poplar with white spruce, Banksian pine and mature aspen further back from shore.

b) Fort Smith, Northwest Territories: 60°01'N, 111°52'W, 29 May 1976 (1 specimen), Elsie Kuyt, domestic garden adjoining aspen poplar-whitespruce-Banksian pine, mixed forest.

I am indebted to Elsie Kuyt for allowing me to use her collection data and Dr. Bird for bringing these data to my attention.