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## CLARIFICATION OF AND COMMENTS ON NORTHERN *SPEYERIA* *HYDASPE* SUBSPECIES (LEPIDOPTERA: NYMPHALIDAE)

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**ABSTRACT.** The geographic distribution and use of three northern *S. hydaspe* subspecies names is reviewed. This is necessary due to literature errors about the type locality of subspecies *rhodope* (Edwards, 1874). The correct placement of the *rhodope* type locality renders the name *S. hydaspe sakuntala* (Skinner, 1911) of interior British Columbia as a junior synonym of *S. hydaspe rhodope*. The name *S. hydaspe minor* (McDunnough, 1927) is available for the coastal populations by those who recognize these as different from those of the interior.

**Additional key words:** *gregsoni* Gunder, 1932, *skinneri* Holland, 1931.

### OVERVIEW OF PERTINENT NAMES

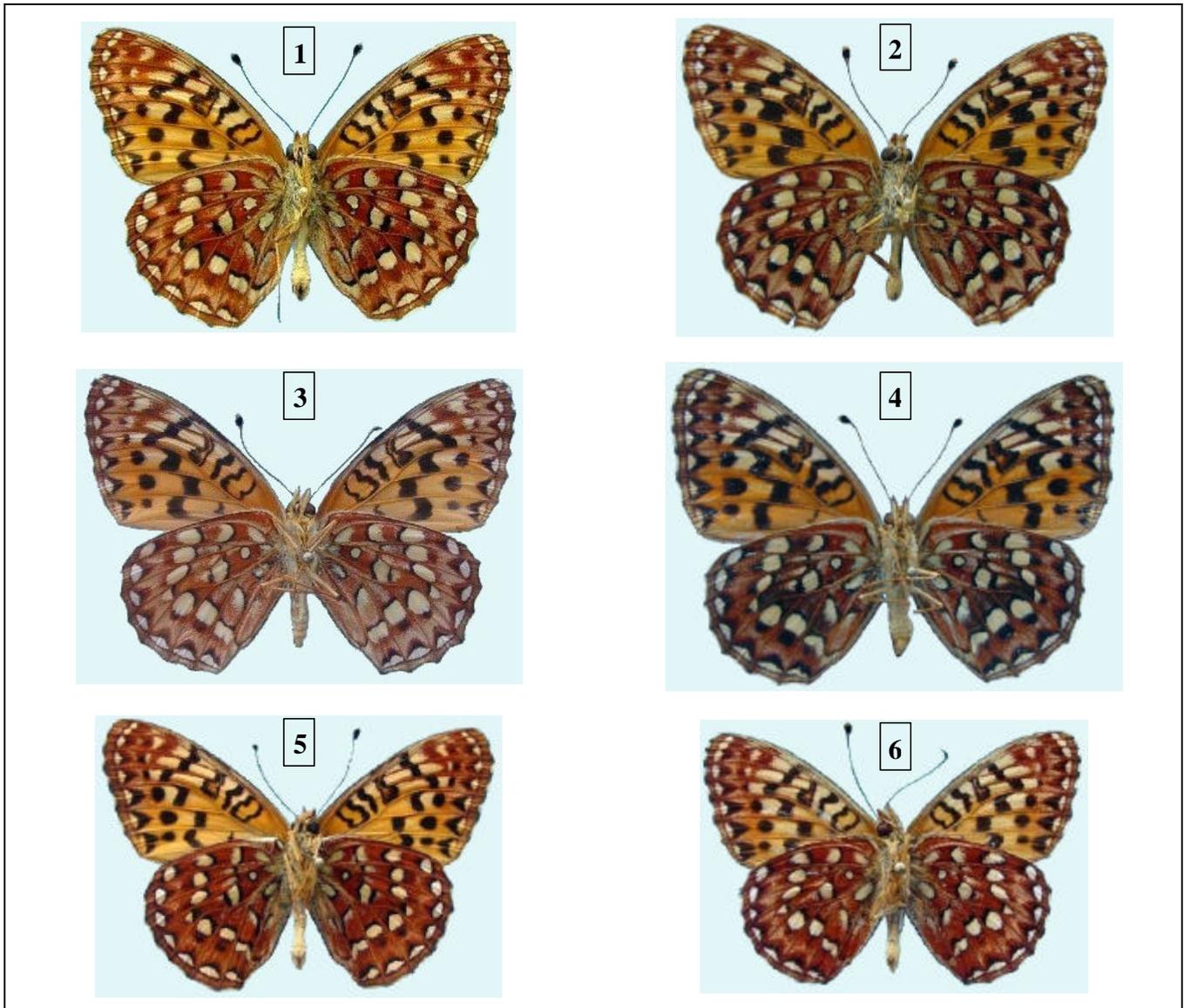
The subspecies name *rhodope* (Edwards 1874) has frequently been used for the *Speyeria hydaspe* (Boisduval, 1869) populations on Vancouver Island and nearby coastal areas of British Columbia (Guppy and Shepard 2001, Howe 1975, Layberry et al. 1998). Dornfeld (1980) viewed *rhodope* as being a butterfly of coastal Washington and British Columbia. Hinchliff (1996) also treated *rhodope* as a coastal taxon. Miller and Brown (1981) and Guppy and Shepard (2001) both use the vague phrase “Fraser River Lowlands” to designate the type locality. Both the distribution noted above and the putative type locality are incorrect.

Edwards (1874) described *rhodope* from three males and one female “taken in British Columbia, in 1873, by G.R. Crotch”. Edwards described a butterfly that is deep red fulvous on the dorsum with the basal portions of both wings dark brown. The ventral hind wings were described as deep red. However, Crotch referred to these butterflies as purple. This may be attributable to differing color perception or the effect of viewing under natural versus artificial light. This may also be due to the type series consisting of both the red and purple color morphs mentioned later in this review. The male wing expanse was given as 2.2 inches for the male and as 2.4 inches for the female.

Skinner (1911) described *sakuntala* from four males and one female taken at Ainsworth, BC; Kaslo, BC; and Laggan, Alberta. Skinner does not give a size for *sakuntala* but McDunnough (1927) says that the wing expanse is 2 inches. Skinner unfortunately does not mention the origin of the comparative “*rhodope*” material he used to compare with his new subspecies. So we cannot be certain that he even compared *sakuntala* with *rhodope* in the traditional use of the name. He did mention comparison with a large series of *rhodope* which may have been in the Academy of Natural Sciences of Philadelphia. He also mentioned submitting the specimens for study by C. Gordon Hewitt, Dominion Entomologist in Ottawa, Ontario. Hewitt had access to the butterfly collection that is now referred to as the Canadian National Collection (CNC). The CNC holdings of *S. hydaspe* collected prior to 1911 totaled some 67 specimens; so

Hewitt appears to have had a reasonable amount of material to work with. What is clear, is that Skinner described the red phenotype of the species that flies in the west Kootenay area of southeastern British Columbia. Skinner was candid enough to state: “What relation it bears to *rhodope* in nature can’t be foretold, but it is sufficiently distinct to call attention to it in the hope that future study will establish its true relationship”.

The level of differences described by Skinner between *sakuntala* and *rhodope* fall within the normal range of variation I have observed from specimens collected near the *sakuntala* type locality. I have examined more than 200 specimens of *sakuntala* from the general area of the type locality and have noted the following: size is variable from small to large; dorsal color is variable from light to dark; ventral hindwing discal area and ventral forewing apical area color comes in two color morphs – red and purple. These color morphs are illustrated in Figures 1 to 4.



**Figs. 1-6:** 1-4: *Speyeria hydaspe rhodope* color morphs (ventral surface); 5-6: *S. hydaspe minor*. **Fig. 1.** *S. h. rhodope*, ♂: red morph: 31 July 1999, Km 3 Conkle Lake road near Rock Creek, British Columbia. **Fig. 2.** *S. h. rhodope*, ♂: purple morph: 31 July 1999, Km 3 Conkle Lake road near Rock Creek, British Columbia. **Fig. 3.** *S. h. rhodope*, ♀: red morph: 11 July 2000, Km 4 West Erie Forest Service road near Erie Lake, British Columbia. **Fig. 4.** *S. h. rhodope*, ♀: purple morph: 11 July 2000, Km 4 West Erie Forest Service road near Erie Lake, British Columbia. **Fig. 5.** *S. h. minor*, ♂: 24 July 2000, Shorts Creek canyon, near Fintry, British Columbia. **Fig. 6.** *S. .h. minor*, ♂: 4 August 2000, Evelyn Creek, Yalakom Forest Service road, NW of Lillooet, British Columbia. All leg. N. Kondla except 5 & 6 leg. D. Threatful. Photos by N. Kondla. (All specimens natural size.)

McDunnough (1927) described *minor* as an altitudinal infrasubspecific form on the basis of 3 males and two females from Mt. McLean; one male from Lillooet and one male from Anderson Lake, British Columbia. The wing expanse given for *minor* is 1 ¾ inches. Dos Passos and Grey correctly attributed authorship of *minor* to McDunnough. I accept this as being compliant with the ICZN provisions on this matter (see Articles 10.2 and 45.6.4.1 of the ICZN fourth edition).

### SYSTEMATIC ANALYSIS OF THESE NAMES

Miller and Brown (1981) gave the type locality of *rhodope* as “Fraser River lowlands” and asserted that this was designated by Brown in 1965. They went on to say that a previous designation by dos Passos and Grey “is rejected”. There are significant errors in, and thus systematic problems created by, this view advanced by Miller and Brown (1981). In actuality, Brown (1965) did not designate a type locality. All he said was that “topotypical *rhodope* hails from the forested, broad river bottoms of the Fraser River system”. This assertion is categorically incorrect and demonstrates that Brown had an inadequate understanding of the geography and history of British Columbia.

Brown (1965) quotes Edwards in *Butterflies of North America* that *rhodope* was collected by G.R. Crotch “on the way from Bates (commonly called 100-mile House) to Beaver Lake”. Brown asserts that Beaver Lake is about 15-20 miles west of Quesnel Lake. I have confirmed this approximate location of Beaver Lake by checking official British Columbia government geographical information. Crotch stated in a letter to Edwards that “the small *Argynnis* with purple beneath was only found in the forest on the way from Bates’s to Beaver Lake”. So the type material was collected in the uplands of the Cariboo district, an unknown distance east of the Fraser River along the old trail used to access the Cariboo mining areas. The type locality of *rhodope*, in the words of the collector of the butterflies and in the words of the describer of the subspecies, is therefore some 300-400 kilometres from the coast. There is no evidence whatsoever that the butterflies were collected in the “forested, broad river-bottoms of the Fraser River system” as alleged by Brown (1965). In fact the above evidence prohibits this speculation.

Dos Passos and Grey (1947) designated a lectotype from one of the Crotch specimens and correctly fixed the type locality of *rhodope* as Cariboo District, British Columbia. Article 76.2 of the ICZN (International Code of Zoological Nomenclature) clearly states that: “The place of origin of the lectotype becomes the type locality of the nominal species-group taxon, despite any previously published statement of the type locality.” Miller and Brown (1981) did not correctly grasp the type locality of the lectotype, so their “rejection” of the dos Passos and Grey type locality is completely without merit.

McDunnough (1927) also correctly identified the type area as being along the old Cariboo trail at about 2500 feet elevation. The Cariboo Wagon Road was built in the years 1862-1864 and was the route to access the Cariboo gold fields. It is an upland road that did not get into the “lowlands” of the Fraser River. He correctly points out that *sakuntala* is a variable form and that Skinner’s “points of distinction do not always hold”. Further, he thought that *minor* would probably be found “all throughout the Cascade and Coast ranges at suitable elevations” and also observed that Vancouver Island material “may possibly be slightly darker in color”.

This leaves us in a situation where the official type locality of subspecies *rhodope* is within the range of subspecies *sakuntala* as mapped by Guppy and Shepard (2001). The subspecies *sakuntala* (Skinner, 1911) therefore falls as a junior synonym of *rhodope* Edwards, 1874. If there is a *bona fide* subspecies difference between the coastal and interior populations; then this at first glance leaves the coastal populations without a subspecies name. But the name *minor* (McDunnough, 1927) is available to apply to the coastal populations until such time as future study presents a convincing case for taking a different approach. Some individuals may chose to simply treat all of the northern populations as subspecies *rhodope* as was done by Scott (1986). However, subspecific differences between coastal and

interior butterflies are the norm in this region rather than the exception. Thus, I am reluctant to simply consider all these populations as taxonomically the same.

An examination of a small series of coastal specimens suggests that the coastal populations of British Columbia may merit recognition as a separate subspecies from *rhodope* of the interior. The primary points of distinction appear to be a darker dorsum, especially darker wing basal areas, and a distinctly maroon color to the ventral hindwing. A typical specimen of *minor* is illustrated in Figure 6. However, butterflies fitting the maroon ventrum phenotype also occur as far east as the west side of the Okanagan valley (Figure 5) and even into southeastern British Columbia as evidenced by the specimen used to illustrate *sakuntala* in Guppy and Shepard (2001).

At present it seems best to view *minor* as occupying the south coastal area of British Columbia and extending an unknown distance into the interior. Note however that none of the three ventral views of *S. hydaspe* specimens illustrated by Guppy and Shepard (2001) show the ventral colors that are congruent with the respective original descriptions of the names attached to the illustrations. I have only seen the red ventrum phenotypes from southwestern Alberta.

There are two final names that warrant brief mention. The taxon *gregsoni* (Gunder 1932) was described as a transitional form from one melanic female collected on Mt. Washington, Vancouver Island. It has been consistently and correctly recognized as an infrasubspecific entity (dos Passos and Grey 1947, dos Passos 1964, Miller and Brown 1981) since it was described. The only point of clarification needed is that the name is associated with the taxon *minor* and is not associated with *rhodope*, unless, of course, one lumps all BC populations under *rhodope*. The taxon *skinneri* (Holland 1931) was proposed as a replacement name for *sakuntala*, wrongly thought to be preoccupied. It should be placed in the synonymy of *rhodope* rather than its traditional location in the synonymy of *sakuntala*.

Of course this entire discussion is predicated on the assumption of a nominal species *S. hydaspe* in this part of North America. I am not aware of any rearing studies to show that the phenotypic variation described herein is in fact variation within one species. Phenotypic variation within populations presently mapped as one subspecies in Guppy and Shepard (2001) exceeds the differences between some named subspecies in California (Emmel 1998, Howe 1975). Thus, rearing and breeding studies should be undertaken. If these have already been done, the results should be published.

## CONCLUSION

The coastal populations that are called *rhodope* in Guppy and Shepard (2001) are not such because 1) the type locality is some hundreds of kilometres from the nearest population of *rhodope* as mapped in their book and because 2) the coastal putative *rhodope* populations are separated from the type locality by populations of subspecies *minor*. The subspecies name *minor* is available for application to the areas mapped as *rhodope* and *minor* in Guppy and Shepard (2001) and the name *rhodope* definitely applies to the areas mapped as *sakuntala* in the same book. The name *rhodope* could also be justifiably used for all British Columbia populations since nobody has ever demonstrated that there are reasonably consistent differences between coastal and interior populations.

Field work is needed to document the distribution of the ventral color morphs in southern British Columbia. It should not be too difficult to eventually accumulate adequate study material because this butterfly does not have the most limited distribution of any *Speyeria* in BC as alleged by Guppy and Shepard (2001). Rather the maps in said book clearly show that it is the second most widespread *Speyeria* in the province. Rearing and examination of gene chemistry may be needed to determine if the variation described herein has any taxonomic significance. The taxonomy of *S. hydaspe* in Alberta and British Columbia should be reassessed once this work has been completed.

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