

LIBELLULA SUBORNATA
(**ODONATA:LIBELLULIDAE**)
IN CANADA

ROBERT A. CANNINGS

Entomology Division
British Columbia Provincial Museum
Victoria, B.C. V8V 1X4

ABSTRACT

The dragonfly *Libellula subornata*, a species of arid southwestern North America, is reported from Canada for the first time. Specimens collected over a number of years at Nanaimo, British Columbia, have recently come to light. Features that distinguish this species from the common *Libellula forensis* and *L. lydia* are noted.

Libellula subornata (Hagen) is a dragonfly of southwestern North America closely related to the widespread *Libellula lydia* Drury. Both species are placed by some workers in a separate genus, *Plathemis* Hagen. Needham and Westfall (1955) note that *L. subornata* normally is found around swales and seepage pools in desert and semidesert areas. They record the species from Chihuahua and Sonora in northern Mexico and from Arizona, California, Colorado, Kansas, Nebraska, Nevada, New Mexico, Texas and Utah in the United States. British Columbia also is mentioned in the distribution, although no explanation is given for this surprising inclusion. More recently the species was recorded in Oklahoma (Bick and Bick 1957) and in southeastern Oregon (Kormondy 1960). Dennis Paulson (pers. comm.) has collected over 4500 dragonfly specimens from all parts of Washington State since 1967 without ever seeing this species.

When Richard Guppy of Thetis Island, British Columbia died in 1980, some of his correspondence was deposited in the British Columbia Provincial Museum. From this source I learned that for many years he had collected dragonflies for Carl Cook of Center, Kentucky. I also discovered that he had supplied Cook with specimens of *L. subornata* from Nanaimo, B.C.

These records are the basis for the inclusion of British Columbia in the distribution given for *L. subornata* in Needham and Westfall (1955). The species was not mentioned in Cannings and Stuart (1977) as it was not included in Walker and Corbet (1975) and was not considered a likely candidate for the Canadian list. Carl Cook (*in litt.*) explains further: "Walker knew about the record because he had the specimens on loan for a time during the period he was working on the early volumes of the Odonata of Canada and Alaska, but I think Corbet did not because he probably overlooked it in Needham and Westfall and had not yet started to correspond with him (Westfall) when he took over work on Volume III."

Guppy collected at least a dozen specimens of *L. subornata* between about 1950 and 1972, most of which are scattered in private collections. Walker's

collection in the Royal Ontario Museum does not contain any specimens (G. B. Wiggins, *in litt.*). Cook still has a single male collected by Richard Guppy at Nanaimo on 28 June 1969. Another male which Cook donated to the B.C. Provincial Museum has the same data except for the date, 5 July 1972.

Since it is well known that during his career Richard Guppy collected only on southern Vancouver Island and adjacent Gulf Islands, it is difficult to dismiss the record of *L. subornata* from Nanaimo as the result of a mixup of Guppy's specimens and data. Similarly, since the specimens were sent to Cook over a period of more than 20 years, a mixup of his own specimens with Guppy's data seems impossible. Although surprising, the evidence suggests that *L. subornata* was collected at Nanaimo, 800 km northwest of its normal range, in a habitat very unlike its normal one. Moreover, the fact that specimens were captured over a long period within a small area suggests not only that the occurrence of *L. subornata* on southern Vancouver Island is not accidental, but also that the species may breed there. Until further specimens are collected, however, the records should be accepted with caution. On 2 July 1982 I visited the locality near Nanaimo where, according to his colleagues, Richard Guppy probably collected the specimens. I saw no *L. subornata* specimens.

L. subornata males key to *L. lydia* in most keys which include only the latter (e.g. Walker and Corbet 1975; Cannings and Stuart 1977). In these cases females will key to *L. forensis*, except in keys using *Plathemis* as a generic name in which case females will not key satisfactorily. Larvae key to *L. lydia*.

L. subornata males can be distinguished from those of *L. lydia* by several characters. The bifid process on the sternum of abdominal segment I is divided only halfway to its base by a shallow V-shaped cleft. The dark pigment on the venter of the labium forms a definite median stripe while in *L. lydia* it is mostly basal and diffuse. Wing markings are distinctive. In *L. subornata* the middle third of the brown nodal band is paler than the rest of the band and almost the entire area between this band

and the wingbase, excluding the basal brown spot, is pruinose white. In *L. lydia* the nodal band is uniformly brown and the basal white area is much less extensive. Females of *L. subornata* do not have the dark wingtips of *L. lydia* females and unlike those of *L. forensis* have the distal dark wing spot divided by a pale area. *L. subornata* larvae have blunt, hairy dorsal hooks on abdominal segments 3 to 6 while those of *L. lydia* have sharp, thorn-like

hooks covered by spiniform setae on the same segments (Levine 1957).

ACKNOWLEDGEMENTS

I thank Mr. Carl Cook and Dr. Glenn Wiggins for information concerning the Canadian specimens of *L. subornata*. Drs. Philip Corbet and Dennis Paulson read the manuscript.

REFERENCES

Bick, G. H. and J. C. Bick. 1957. The Odonata of Oklahoma. *Southw. Nat.* 2: 1-8.
 Cannings, R. A. and K. M. Stuart. 1977. The dragonflies of British Columbia. British Columbia Provincial Museum Handbook No. 35, Victoria. 254 pp.
 Kormondy, E. J. 1960. New North American records of anisopterous Odonata. *Ent. News* 71: 121-130.
 Levine, H. R. 1957. Anatomy and taxonomy of the mature naiads of the dragonfly genus *Plathemis* (Family Libellulidae). *Smithson. Misc. Coll.* 134(11): 1-28.
 Needham, J. G. and M. J. Westfall. 1955. A manual of the dragonflies of North America (Anisoptera) including the Greater Antilles and the Provinces of the Mexican border. University of California Press, Berkeley. 615 pp.
 Walker, E. M. and P. S. Corbet. 1975. The Odonata of Canada and Alaska. III. University of Toronto Press, Toronto and Buffalo. 307 pp.



**SCIENTIFIC WRITING
 FOR
 GRADUATE STUDENTS**

This manual is a "must" for those who would introduce courses of instruction in scientific writing into university graduate schools. The first nine chapters provide the essentials for "Writing a Journal Article," and the remaining five chapters cover "Related Topics" in scientific communication.

CONTENTS: 1. Clearing Away the Underbrush • 2. The Ground Plan • 3. The Master Plan • 4. The First Draft • 5. The First Revision: Structural Alterations • 6. Further Revision: Polishing the Style • 7. Editing Assignments • 8. The Final Steps • 9. Responding to the Editor • 10. Design of Tables and Figures • 11. Preparation for Writing the Doctoral Thesis • 12. Writing a Research Project Proposal • 13. Oral Presentation of a Scientific Paper • 14. Principles and Practices in Searching the Scientific Literature

Paperbound; ISBN: 0-914340-01-8; Published 1968, reprinted 1983; Trim size: 6 x 9 inches; 190 pages

Regular Price: \$9.75 (10% discount on 10 or more copies delivered to one address)

CBE Member Discount Price: \$8.75 (single copy paid by personal check)

Terms of Sale: All sales final; no returns.

Prepayment required; U.S. currency drawn on a U.S. bank.

Price includes BOOK RATE postage.

For faster delivery--first class, air mail, or UPS available at additional charge (book weight, 11.5 oz).

Maryland residents, please add 5% sales tax.

COUNCIL OF BIOLOGY EDITORS, INC.
 9650 Rockville Pike, Bethesda, MD 20814