

Zora hespera in British Columbia: a new spider family record for Canada (Araneae: Zoridae)

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ABSTRACT

The collection of specimens of *Zora hespera* from two localities on southern Vancouver Island, British Columbia are the first records of zorid spiders in Canada. To aid identification of this spider, drawings of the species diagnostic characters are presented along with brief discussions of the genus, the family, and genitalic terminology conventions followed.

Key words: *Zora*, Zoridae, Vancouver Island, pitfall trap, distribution diversity.

INTRODUCTION

The spider family Zoridae comprises about a dozen genera (Platnick 1993) probably most closely related to the large and primarily tropical family Ctenidae. The genus *Zora* C. L. Koch has a Holarctic distribution but is most diverse in the Old World. Two species, *Z. pumila* (Hentz) and *Z. hespera* Corey and Mott, are the only known Nearctic zorids (Roth 1993). Until now these species were recorded only from the eastern (*Z. pumila*) and far western (*Z. hespera*) United States (Corey and Mott 1991). In Washington state (previously the northern limit of its range) *Z. hespera* has been collected in the extreme south along the Columbia River basin near Bingen and from north of Yakima (Crawford 1988).

The natural history of zorid spiders is not well documented. Species of *Zora* are known to be active, diurnal, ground and shrub dwelling hunters (Corey and Mott 1991, Kaston 1948, Roberts 1985) which spin no retreats and attach their flattened egg cases to the underside of rocks or other objects (Bristowe 1958, Kaston 1948). They are most likely to be encountered in open, sunny areas with adult females in evidence year round and adult males during the spring and early summer.

This paper reports the first collections of a zorid, *Z. hespera*, in Canada. In late May, 1994 one of us (RGB) collected a single male *Z. hespera* indoors in a rural area of the Saanich Peninsula just north of Victoria, British Columbia (this southern Vancouver Island locality is several hundred kilometres north of the Washington collection localities). Subsequent determination of three other males and a female collected in pitfall traps elsewhere on southern Vancouver Island (during a University of British Columbia arthropod diversity study) convinced us that the species is established in British Columbia.

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The Saanich Peninsula collection site is an office and laboratory building in an open grassy field with adjacent young plantations of Douglas-fir (*Pseudotsuga menziesii* (Mirbel) Franco) and western white pine (*Pinus monticola* Dougl. ex D. Don) seed orchards surrounded by active agricultural fields on two sides and mature, second growth mixed conifers dominated by Douglas-fir and grand fir (*Abies grandis* (Dougl. ex D. Don) Lindl.) to the north and west. The pitfall trapping site is a recently replanted Douglas-fir regeneration site in the Koksilah River drainage just west of Shawnigan Lake (between Duncan and Victoria). This site is in the dry part of the Coastal Western Hemlock biogeoclimatic zone and is characterized by exposed rocky outcrops, invasive herbaceous plants, and scattered remnant conifers situated among Douglas-fir dominated stands of varying maturity. Because of the presence of forest stands varying in age from recently replanted to old growth and all having similar slope, elevation, and aspect, this regeneration site and the area around it have been the target of several research studies on the effects of forestry practices on biodiversity.

Specimens are preserved in 70% ethanol in the collections of RGB (Saanich specimen) and the University of British Columbia. All specimens and their parts were examined in 70% ethanol with a Leitz MS5 dissecting microscope or in clove oil (female genitalia only) with a Nikon Labophot phase contrast microscope. Drawings were made with the aid of a squared grid reticule in one ocular lens of the Nikon (female genitalia) or the Leitz (male palp). Drawings are included here to facilitate the identification of this species during future work on the British Columbia araneofauna.

TAXONOMY

In British Columbia, *Z. hespera* is likely to be confused only with small lycosids because of its behaviour and preferred habitat (see above), eye arrangement, and general size and shape. Specimens of this species are relatively small (average total length ranging from 3 to 5 mm), light coloured spiders with dark abdominal markings, heavily spotted legs, and two very conspicuous dark bands running from the posterior lateral eyes to the posterior edge of the carapace.

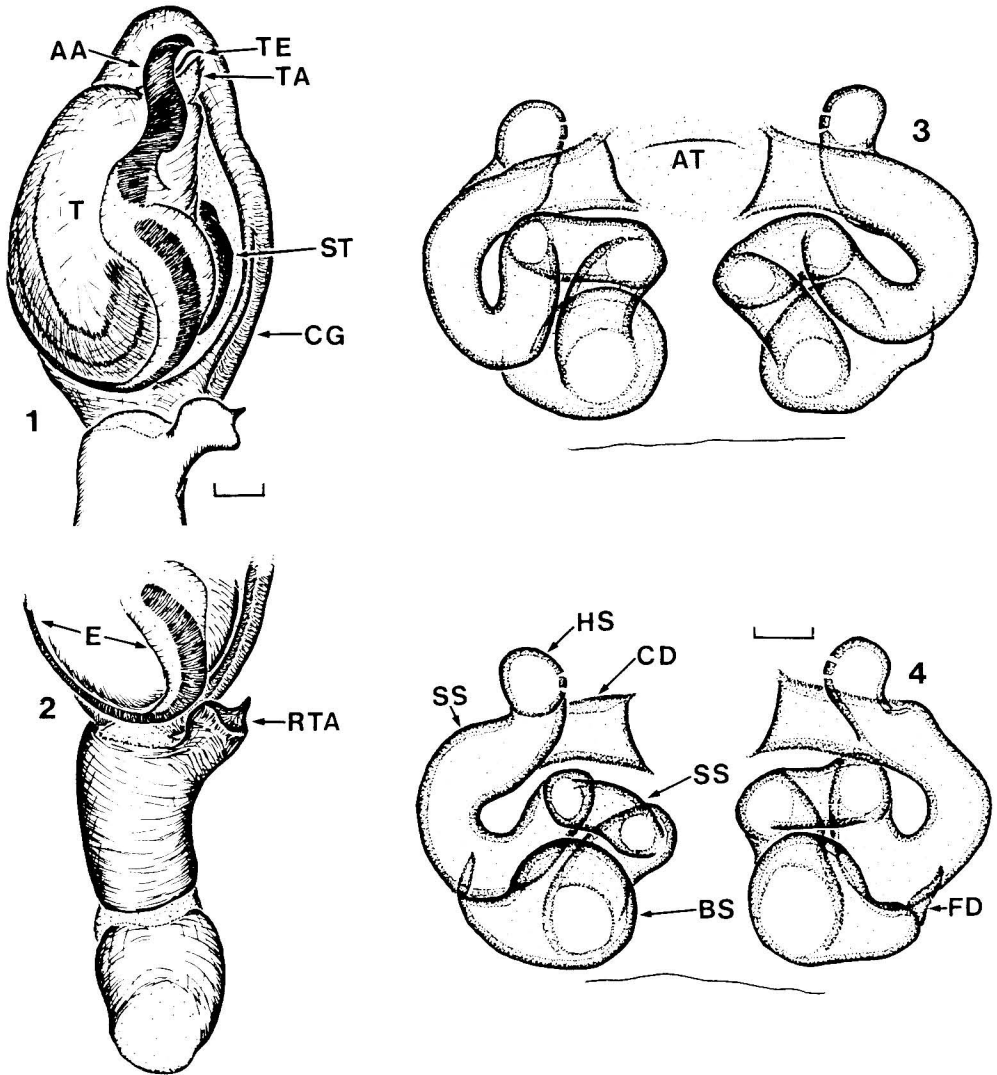
Viewed dorsally the anterior eye row (four eyes) is nearly straight. The remaining four eyes make up a posterior eye row so strongly recurved that there appear to be three rows of eyes on the cephalothorax. The eyes are all small and subequal. This eye arrangement is somewhat lycosid-like and also is typical of the ctenids (which are not known to occur in Canada).

From lycosids (and ctenids) *Z. hespera* is readily distinguished by the distinctive series of six to eight pairs of very long, overlapping, ventral macrosetae on the tibiae of legs I and II. Some small and cryptic phrurolithine clubionid (e.g., *Scotinella* Banks), cybaeid (e.g., *Cybaeota* Chamberlin and Ivie), and hahniid (e.g., *Dirksia* Chamberlin and Ivie) genera sport similar series of distinctive ventral tibial macrosetae but have eyes in only two rows. Additionally, males of *Z. hespera* have a retrolateral tibial apophysis (Figs. 1, 2) (lacking in lycosids) on the pedipalps and females have no distinctive, sclerotized epigynal features (lycosid females generally have distinctive epigyna with variously developed and well sclerotized plates and cavities). Zorids have two tarsal claws on each leg, lycosids have three.

Species Diagnosis. No other zorid species is likely to be encountered in British Columbia but the following characters will serve to distinguish this species from the eastern species *Z. pumila*.

Male (left palpus, ventral view): Retrolateral tibial apophysis with acuminate tip and shallow, ventral, transverse concavity subdistally (Fig. 2); simple, sinusoidal apical apophysis extending anteriorly from base of embolus, with retrolaterally directed, bluntly acuminate tip (Fig. 1).

Female: In ventral view (Fig. 3) atrium a shallow depression bordered laterally by inconspicuous, slit-like atrial openings leading to the internal vulval ducting; in dorsal view (Fig. 4) short, poorly defined copulatory ducts lead laterally from atrial openings to spermathecal stalks; stalks sinuous, moderately convoluted but simple and not coiled.



Figures 1-4. Genital characters of *Zora hespera*. 1-2, male, left palpus, ventral view: 1, tarsus with genital bulb; 2, patella, tibia, and base of tarsus; scale bar = 0.1 mm; AA--apical apophysis, CG--cymbial groove, E--embolus, RTA--retrolateral tibial apophysis, ST--subtegulum, T--tegulum, TA--tegular apophysis, TE--tip of embolus. 3-4, female, cleared vulva: 3, ventral view; 4, dorsal view; scale bar = 0.05 mm; AT--atrium, BS--spermathecal base, CD--copulatory duct, FD--fertilization duct, HS--spermathecal head, SS--spermathecal stalk.

Other genitalic characters.

Male: Cymbium of palpal tarsus with pronounced longitudinal groove; subtegulum heavily sclerotized, compact, and slightly visible in ventral view; tegulum simple (i.e., no conspicuous, sclerotized tegular apophyses), convex, and lightly sclerotized with outline of receptaculum seminis visible through integument; inconspicuous membranous tegular apophysis located distally on tegulum; embolus simple, well sclerotized with membranous borders proximally (Figs. 1, 2), narrowing distally and proceeding clockwise around edge of tegulum, terminating inconspicuously between tegular and apical apophyses.

Female: Short spermathecal heads project anteriorly from junction of connecting ducts and spermathecal stalks; simple primary pores present on spermathecal heads (schematically represented in Figs. 3, 4); no complex "dictynoid" pores on spermathecal stalks; stalks lead posteriorly to simple, bulbous spermathecal bases just anterior of epigastric groove; poorly defined fertilization ducts exit anterolaterally from spermathecal bases (Fig. 4).

DISCUSSION

Genitalic terminology follows Bennett (1991, 1992), Coddington (1990), and Sierwald (1989, 1990) "in an effort to standardize names of presumably homologous parts in different taxa" (Bennett 1992). Female terms used here do not differ significantly from those of Corey and Mott (1991) but male terms do.

Here we term the conductor of Corey and Mott (1991) the apical apophysis. A true conductor is a rigid extension of the tegular wall and thus a component of the middle division of the genital bulb (Bennett 1991, Sierwald 1990). (The subtegulum, tegulum, and embolus are sclerites respectively typical of the basal, middle, and apical divisions of the primitive tripartite spider genital bulb.) This structure of *Z. hespera* appears to be a *functional* conductor (i.e. it is closely associated with the tip of the embolus and probably serves to support and guide the embolus during mating) but, because it is membranously attached to the embolar base, it is a sclerite of the apical division and not a *true* conductor (i.e., it is an apical apophysis not a tegular apophysis).

Two sclerites may be associated with the tegulum in male spiders: A true conductor as discussed above and a median apophysis membranously attached to the tegulum (Bennett 1991, Sierwald 1990). Probably the membranous tegular structure associated with the tips of the embolus and the apical apophysis in *Z. hespera* is a median apophysis but, as we did not study it in detail, we maintain a conservative stance and simply refer to it as a tegular apophysis.

Material examined. Specimen deposition noted above. CANADA: BC: *southern Vancouver Is.*; Saanichton, Saanich Seed Orchard, indoors, 26/V/1994 (R.G. Bennett), 1 male; Koksilah, 48°39'25"N 123°46'10"W, 26/V-23/VI/1992 (K.G. Craig), 3 males; 23/VI-28/VII/1992 (K.G. Craig), 1 female.

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