Orchid weevils (Coleoptera: Curculionidae) in Canada

Jens Prena[1]

Abstract—The study presents information about the taxonomy, natural history, and distribution of orchid weevils (Coleoptera: Curculionidae) in Canada. Native are *Stethobaris ovata* (LeConte, 1869) (= *S. congermana* Casey, 1892 **restored synonymy**; = *S. convergens* Casey, 1920 **new synonymy**), *S. incompta* Casey, 1892 (= *S. commixta* Blatchley, 1916 **new synonymy**), and *S. sacajaweae* Prena, **new species**, with all of them also being present in the adjacent temperate zone of the United States of America. *Orchidophilus aterrimus* (Waterhouse, 1874) and *S. laevimargo* (Champion, 1916) have been found on imported orchid cultivars but did not become established in natural habitats.

Introduction

With more than 25 000 described species, orchids (Orchidaceae) represent a plentiful resource for herbivorous insects, either as food, larval host, or both (Swezey 1945; Rivera-Coto and Corrales-Moreira 2007). Weevils (Coleoptera: Curculionidae) in particular use this resource extensively. Associations with orchids have been documented for species of the weevil subfamilies Baridinae, Brachycerinae, Conoderinae, Cossoninae, Cyclominae, Dryophthorinae, Entiminae, Molytinae, and Scolytinae (Weiss 1917; Swezey 1945; Voss 1961; Morimoto 1994). When introduced to other regions, these beetles may pose a risk to native orchid populations and their habitats if they become established. Even though Voss (1961) considered this a rather unlikely scenario in temperate regions, some natural hosts of northern orchid weevils are holarctic and inadvertent dispersal and establishment of orchid weevils across temperate biogeographic realms seems only a matter of time.

The present study is concerned with the native North American orchid weevils found in Canada. All three species belong to the subfamily Baridinae in the sense of Bouchard *et al*. (2011), or to the respective subordinate rank (supertribe or tribe) of Conoderinae in more recent classifications (Prena *et al*. 2014; Pullen *et al*. 2014). They represent the most northern populations of orchid weevils anywhere in the world. Two of them attracted repeatedly the attention of botanists and ecologists during their studies of North American orchids, with *Stethobaris ovata* (LeConte, 1869) so far having caused the greatest concern in Canada (Brown 1966; Reddoch and Reddoch 1997, 2009; Light and MacConaill 2011). Not treated herein (but included in the key) are two unestablished exotic species of the same subfamily, which have been found sporadically on imported orchid cultivars in British Columbia, Nova Scotia, and Ontario, Canada before 1990 (McNamara 1991; Majka *et al*. 2007b; Prena 2008). The first, *Orchidophilus aterrimus* (Waterhouse, 1874), is native to the Indo-Pacific region and has been dispersed widely with traded orchids (Prena 2008). The other, *Stethobaris laevimargo* (Champion 1916), a Neotropical species with uncertain provenance, appeared for the first time around 1915 in New Jersey and New York, United States of America (Champion 1916; Weiss 1917) and afterward at many other places in North America including Ontario.

Material and methods

Weevil specimens were studied from the following collections and the acronyms are used to refer to them in the text: American Museum of Natural History, New York, New York, United States of America (AMNH); Canadian Museum

Received 22 June 2016. Accepted 5 August 2016. First published online 6 January 2017.

J. Prena,[1] Mühlendamm 8a, 18055 Rostock, Germany

[1]Corresponding author (e-mail: baridinae@gmx.de).

Subject editor: Derek Sikes
doi:10.4039/tce.2016.56
http://zoobank.org/urn:lsid:zoobank.org:pub:38277031-523C-41C8-931C-BF771DEE7219

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https://doi.org/10.4039/tce.2016.56 Published online by Cambridge University Press

of Nature, Ottawa, Ontario, Canada (CMNC); Canadian National Collection of Insects, Ottawa, Ontario, Canada (CNCI); Pierre de Tonnacour personal collection, Terrasse-Vaudreuil, Québec, Canada (CPTO); Charles W. and Lois O'Brien personal collection, Green Valley, Arizona, United States of America (CWOB); Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, United States of America (MCZ); Nova Scotia Department of Natural Resources, Shubenacadie, Nova Scotia, Canada (NSNR); Reginald P. Webster personal collection, Charters Settlement, New Brunswick, Canada (RPWC); Texas A&M University, College Station, Texas, United States of America (TAMU); University College of Cape Breton, Sydney, Nova Scotia, Canada (UCCB); and Smithsonian National Museum of Natural History, Washington, District of Columbia, United States of America (USNM). The data pertaining to NSNR, RPWC, and UCCB are verified records (Majka *et al*. 2007a, 2007b) for specimens not studied by myself. Collecting records are arranged by provinces, from west to east, and alphabetically within provinces. Additional state records from the United States of America are given without details (all data in my database, available on request) using the same regions as in O'Brien and Wibmer (1982).

Measurements of length were taken with a micrometer grid to the nearest tenth of a mm. Total length was measured from the elytral apex to the anterior margin of eye, and standard length to the anterior margin of pronotum.

Names of orchid species taken from the literature and labels were adjusted to modern names (National Plant Data Team 2016). For example, all associations reported for *Habenaria* Willdenow apply to species of *Platanthera* Richard. The record of "*Habenaria hyperborea*" by S.D. Hicks (Brown 1966) is interpreted as *Platanthera aquilonis* Sheviak. Unpublished data used herein for tallies of host associations are available on request.

Stethobaris LeConte, 1876

Stethobaris LeConte, 1876: 302. Type species *Baridius ovatus* LeConte, 1869, by subsequent designation (Brown 1966) under erroneous assumption of monotypy (two nominal species plus one subjective synonym originally were included on pages 303 and 420, making the synonym eligible for designation).

Diorymerellus Champion, 1908: 252. Type species *Diorymerellus laevipennis* Champion, 1908, by original designation. Synonymy with *Stethobaris* by Brown (1966).

Diagnosis. Species of *Stethobaris* are small (2–4 mm, rarely up to 6 mm), glabrous, rather shapelessly ovate, black to red weevils without metallic sheen. Their recognition has been, and to a considerable degree still is, obscured by the great diversity of ovate New World barids with similarly depauperate suites of morphological characters. Males of probably all tropical species of *Stethobaris* in the widest sense have up to three elytral interstriae with distinct subapical sulci (see fig. 5 in Prena and O'Brien 2011). However, the species of both temperate hemispheres of the New World have a mere, usually inconspicuous, single streak of enlarged interstrial pits whereas the type species lacks this apomorphy altogether. Other morphological characters of diagnostic value include a conspicuous, subtriangular prosternal impression with two anterior pits; relatively large antennal club; and small, basally separate claws. The entire suite of characters applies to ~ 45 described species currently placed in *Stethobaris* LeConte, 1876 (including *Diorymerellus* Champion, 1908); *Cerpheres* Champion, 1908; *Lasiobaris* Champion, 1909 (with pilose surface); *Montella* Bondar, 1948; *Ovanius* Casey, 1922; and *Prodinus* Casey, 1922. Prena and O'Brien (2011) referred to this complex as *Stethobaris* sensu lato, with *Stethobaris* sensu stricto including the northern species with poorly developed or missing male interstrial sulci (the plesiomorphic condition). A similar and possibly related genus of orchid weevils occurs in eastern Asia. I have seen approximately six reddish-brown species of *Phrissoderes* Marshall, 1948, all with a similar depression on the prosternum as *Stethobaris* but with unmodified male interstriae and long, widely divergent claws. This is also one of the few presently known baridine genera outside the New World that have species with prosternal spines. Like in *Stethobaris*, most species of *Phrissoderes* are tropical, but at least *P. rufitarsis* (Roelofs, 1875) has a Palaearctic range (Prena 2011).

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Distribution and diversity. In broad terms, species of *Stethobaris* occur with distinctly more than 100 species in the New World from Canada down to at least Buenos Aires (Argentina) and Montevideo (Uruguay) as well as in the Greater and Lesser Antilles. The present-day distribution in Canada shows a conspicuous gap that corresponds closely with the extent of the Laurentide Ice Sheet around 10 000 BC (Dyke 2004). Numerous species have been and still are being dispersed outside their natural realm with traded ornamental plants. One amaryllid-associated species with uncertain origin became established in Barbados and the southeastern United States of America (Prena and O'Brien 2011). North America north of Mexico has two or three introduced and seven native species, of which *Stethobaris egregia* Casey, 1892 is essentially Central American and reaches southern Arizona and Texas, United States of America. However, the centre of diversity is in the Neotropics, from where only a very small fraction of the occurring species has been described.

Natural history. Although species of *Stethobaris* sensu lato are widespread in the New World and cause much concern among orchid growers, relatively little is known about their natural history. The best-studied species, *S. ovata*, has been reported from five orchid genera in three subfamilies (details in taxonomic section below). Howden (1995) found the female to be adaptable to the properties of the available hosts, with an oviposition behaviour that would change from host to host. Females deposited on nearly any part of the local orchid species in Ottawa, Ontario but appeared to prefer tender tissue. In a longer-term field study conducted in Québec, Light and MacConaill (2011) determined a mean of 24% infested fruit capsules on *Cypripedium parviflorum* var. *pubescens* (Willdenow) Knight, with two out of 10 years showing values above 50%. Another study with comprehensive life history data is that by Epsky *et al.* (2008) on the impact of *Stethobaris nemesis* Prena and O'Brien (2011) on *Hippeastrum* Herbert (Amaryllidaceae) hybrids. The weevils fed on and the larvae developed in the thickened leaf base but the authors did not explore whether orchids could be suitable alternative hosts. Prena and O'Brien (2011) mentioned that 48 species of *Stethobaris* sensu lato had been found on Orchidaceae and six on Amaryllidaceae. My unpublished records include associations with 33 orchid genera (Epidendroideae 25, Orchidoideae 5, Cypripedioideae 2, Vanilloideae 1) and five amaryllid genera but this tally is by no means representative of the actual host range.

Species native to Canada

Stethobaris ovata (LeConte)

Baridius ovatus LeConte, 1869: 363. Transferred to *Stethobaris* by LeConte (LeConte and Horn 1876).

Stethobaris congermana Casey, 1892: 657. Synonymised with *S. ovata* by Blatchley and Leng (1916). Resurrected by Casey (1920). **Reestablished synonymy.**

Stethobaris convergens Casey, 1920: 506. **New synonym**.

Diagnosis. *Stethobaris ovata* has a more strongly arched elytral disc than the other two native species (Fig. 2). The ovate penis with conspicuous denticles on the internal sac (Fig. 7) is highly diagnostic.

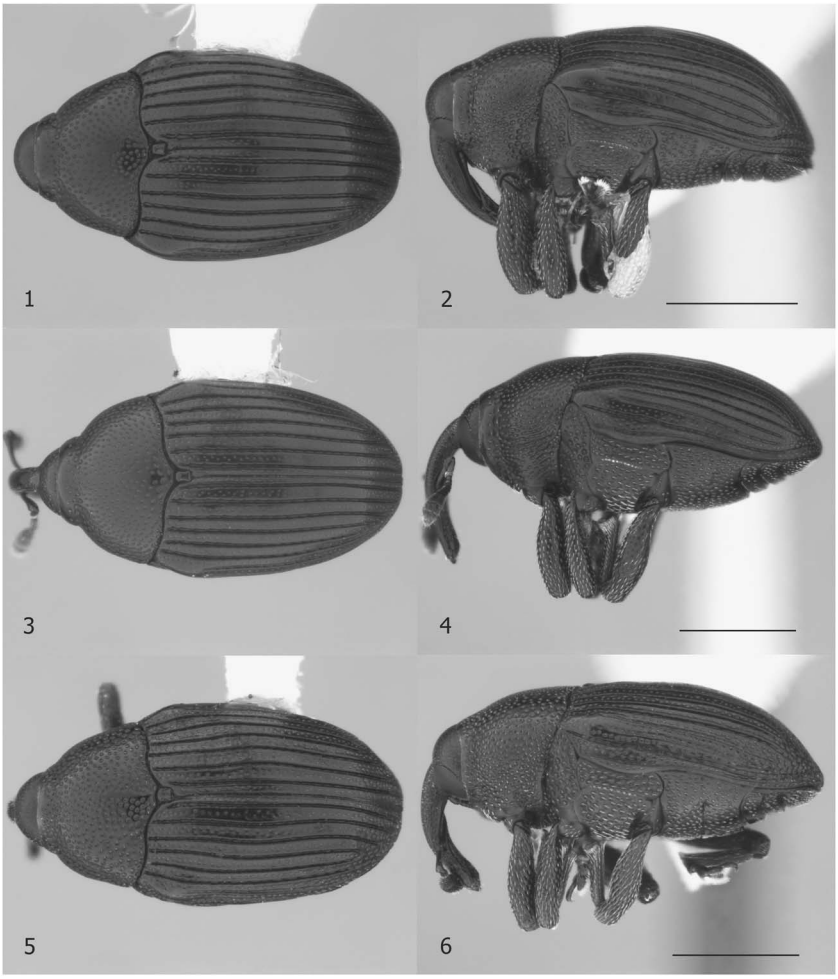
Distribution. *Stethobaris ovata* occurs in eastern Canada south of the Saint Lawrence River and along the northern shores of Lake Ontario and Lake Erie (Nova Scotia, New Brunswick, Ontario, Québec). The western range continuous in the United States of America south of the Great Lakes at least to Wisconsin and connects to an old Canadian record from Manitoba. In the United States of America, the species occurs in the northeast (Connecticut, District of Columbia, Indiana, Massachusetts, Maryland, Michigan, New Jersey, New York, Ohio, Wisconsin), southeast (Alabama, Arkansas, Georgia, Kentucky, Louisiana, Tennessee, Virginia, West Virginia), southwest (Oklahoma, Texas), and central-north (Kansas, Missouri).

Natural history. Adult *S. ovata* have been found on Cypripedioideae (*Cypripedium acaule* Aiton, *Cypripedium arietinum* Brown, *Cypripedium candidum* Muhlenberg *ex* Willdenow, and *Cypripedium parviflorum* var. *pubescens*), Epidendroideae (*Corallorhiza striata* Lindley, *Corallorhiza trifida* Châtel, *Epipactis helleborine* (Linnaeus) Crantz), and Orchidoideae (*Amerorchis rotundifolia* (Banks *ex* Pursh) Hultén, *Galearis spectabilis* (Linnaeus) Rafinesque, *Platanthera aquilonis*, *P. leucophaea* (Nuttall) Lindley, *P. psycodes* (Linnaeus) Gray, *Spiranthes casei* Catling and Cruise) (Harrington 1884; Brown 1966; Judd 1979; Howden 1995; Reddoch and Reddoch 1997, 2009; Dunford *et al.* 2006;

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Figs. 1–6. *Stethobaris*, dorsal and lateral habitus. **1–2**. *Stethobaris ovata* male. **3–4**. *Stethobaris incompta* female. **5–6**. *Stethobaris sacajaweae* male. Scale bar = 1 mm.

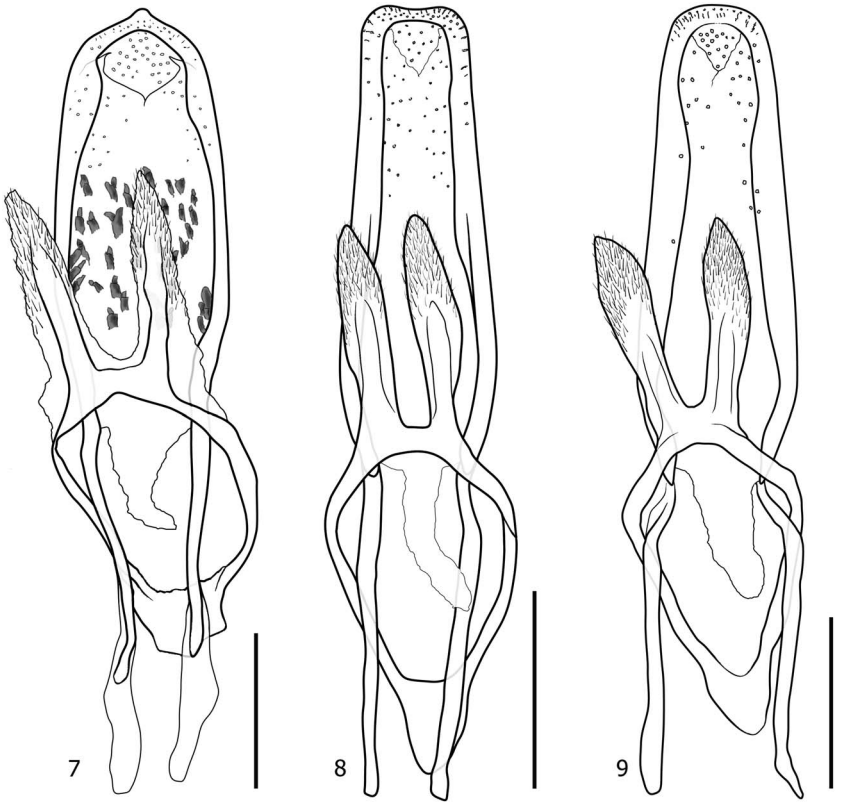


Light and MacConaill 2011; Prena and O'Brien 2011; Walsh *et al*. 2014). Along with *Orchidophilus aterrimus* and *O. epidendri* (Murray, 1869), *S. ovata* is one of the few orchid weevils known to develop in Cypripedioideae, or lady's slipper orchids, whereas Epidendroideae and, to a lesser degree, Orchidoideae attract many weevil predators (J.P., unpublished data). Howden (1995) documented the oviposition behaviour at one site in Ottawa, Ontario. Single eggs were laid in May/June primarily in the stems of *Corallorhiza trifida* and, following the demise of this orchid species, primarily in the flowers of *Epipactis helleborine*. She concluded from her observations that the females changed their oviposition strategy because of the harder and tougher stem of *E. helleborine*. Light and MacConaill (2011) found 2–59% of the *Cypripedium parviflorum* fruit capsules to be infested by *S. ovata* during a 10-year study in Parc de la Gatineau, Québec, with an average infestation rate of 24% in a total of 3293 examined capsules on 391 plants. The same authors observed that adult weevils started feeding upon buds and flowers of *E. helleborine* in late June to early July and oviposited in stems and developing fruits. Nothing is known about the development of the larva and the pupation site. Walsh *et al*. (2014) cite "M. Light in litteris" that *S. ovata* may have two

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Figs. 7–9. *Stethobaris*, aedeagus, dorsal view. **7**. *Stethobaris ovata*. **8**. *Stethobaris incompta*. **9**. *Stethobaris sacajaweae*. Scale bar = 0.2 mm.



generations per year but this would be unusual for a baridine weevil of the temperate zone.

Material examined. CANADA: Manitoba: Riding Mountain National Park, 9.vi.1937, W.J. Brown (CNCI, one specimen). Ontario: Campbellville, 24.v.1978, W.A. Attwater (CMNC, one specimen); 7 km W Carleton Place, 26.vi.1980, S.J. Miller (CNCI, one specimen); Dundas, 18.v.1979, K.L. Bailey (CMNC, one specimen); Erin, 17.vi.1979, J. Ernst (CMNC, one specimen); Foxboro, C.J. Edwards (CMNC, one specimen); Guelph, South Arboretum, 22.v.1985, B.V. Brown (CMNC, one specimen); Hamilton, 26.vi.1980, 16.vii.1980, 30.vi–8.vii.1981 (three specimens), 19–24.vii.1980 (two specimens), 12.vi.1980 (two specimens), 23.v–3.vi.1982, 23–29.v.1981 (two specimens), 7.vi.1981 (two specimens), 15.v.1981 (two specimens), 2–7.viii.1981, 14–19.vii.1981, 7.vi.1981, 28.vi–14.vii.1982, 23.vii.1980, 14–26.vii.1982, 28.vi.1980, M. Sanborne (CNCI, 23 specimens); Hamilton, 3.vii.1979, K.L. Bailey (CMNC, one specimen); Milton, 21–30.viii.1981, M. Sanborne (CNCI, one specimen); Ottawa, 24.vi.1995, 25.vii.1986 (five specimens), 27.v.1987 (four specimens), H. and A. Howden (CMNC, 10 specimens); Prince Edward County, 16.vi.1957, J.F. Brimley (CNCI, one specimen); Rondeau Provincial Park, 1–8.viii.1973, W.R. Mason (CNCI, one specimen); Rondeau Provincial Park, 2.vi.1985, L. LeSage (CNCI, one specimen); Rondeau Provincial Park, 1–9.viii.1985, L. LeSage and A. Woodliffe (CNCI, three specimens); Rondeau Provincial Park, 2–13.vii.1985 (CNCI, four specimens); Rondeau Provincial Park, 1–5.ix.1985 (CNCI, 1 specimen); Shirleys Bay, 15 km W Ottawa, 1.vii.1984, M. Kaulbars (CMNC, 27 specimens); Saint Lawrence Islands National Park, McDonald Island, 28.vii.1976, W. Reid (CNCI,

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two specimens); Saint Lawrence Islands National Park, Twarty Island, 15.viii.1976, 16.vii.1976, 6.viii.1976, (no date), A. Carter and W. Reid (CNCI, four specimens); Saint Lawrence Islands National Park, 20.vii.1976, W. Reid (CNCI, one specimen); Windsor, 23.vi.1985, B. Gill (CMNC, one specimen). Québec: Bécancour, 18.vi.1983, L. LeSage (CNCI, one specimen); Gatineau Park, Dannison Dam, 1–3.viii.1988, M. Light (CMNC, seven specimens); Hull, 28.vi.1965 (CNCI, one specimen); Montréal, 12.vi.1971, 2.vi.1972 (two specimens), 30.v.1972, 18.vi.1979, E.J. Kiteley (CNCI, five specimens); Notre-Dame-de-l'Ile-Perrot (Vaudreuil), 29.v.2012, P. de Tonnacour (CPTO, one specimen); Old Chelsea, Summit King Mountain, 16.vi.1965, D.D. Munroe (CNCI, one specimen); Terrasse-Vaudreuil (Vaudreuil), 20.vi. 1994, P. de Tonnacour (CPTO, three specimens); Vercheres Varennes, 6.vi.2003, C. Chantal (CMNC, one specimen). New Brunswick: Edmundston, Madawaska County, 17.vi.2012, R. Migneault (bugguide.net/node/view/736340); Shepody National Wildlife Area, Mary's Point section, 30.vii.2004, R.P. Webster (RPWC, one specimen). Nova Scotia: Debert, Colchert County, 23.vi.1995, E. Georgeson (NSNR, one specimen); Shubenacadie, Colchert County, 8.vii.1998, J. Ogden (NSNR, one specimen); Rear Estmere, Inverness County, Cape Breton, J.M. MacMillan, 9.vi.1996 (UCCB, one specimen); Sydney, Cape Breton, 19.vi.1995, B.L. Musgrave (UCCB, one specimen).

Stethobaris incompta Casey

Stethobaris incompta Casey, 1892: 655.

Stethobaris commixta Blatchley, 1916: 407 (Blatchley and Leng 1916). **New synonym**.

Diagnosis. Many *S. incompta* can be recognised by elongate confluent punctation on the pronotal flank. Towards the eastern and western perimeter of the range, this strigose surface changes gradually to an ordinary punctation similar to that present in the other two native species. In eastern Canada, such specimens can be distinguished with confidence from possibly co-occurring *S. ovata* by dissection of males and, with some practice, by comparing body shapes (Fig. 1–4). In western Canada, the only other species is *S. sacajaweae*, with shiny, longitudinally depressed elytral interstriae. *Stethobaris corpulenta* LeConte, 1876 from Florida and South Carolina, United States of America is very similar to non-strigose *S. incompta* but the penis is convex apically (notched in *S. incompta*, Fig. 7).

Notes. Blatchley (Blatchley and Leng 1916) proposed *S. commixta* for a species misidentified by Casey (1892) as *S. ovata* (LeConte 1869), based on the study of LeConte's four syntypes, information provided in Casey (1892), and specimens of his own and F. Blanchard's collections. Casey (1920) was unconcerned about the taxonomical aspects of this action but claimed his misidentified Massachusetts specimen to be the type for Blatchley's species. This is unjustified because (i) it had not been included in the description and (ii) *S. commixta* did not replace an available name described from this particular specimen. A lectotype was designated by Blatchley (1922), which was cited again in Blatchley (1930) although with a different gender.

Casey and Blatchley each had one *S. incompta* that they distinguished from *S. commixta* by slightly different strial punctation. Because this character varies in the ~ 200 specimens examined by me, I consider *S. commixta* as a junior subjective synonym of *S. incompta* (**new synonymy**). The present location of Blatchley's lectotype of *S. commixta* from Steuben County, Indiana, United States of America (and several other Baridinae described by him) is unknown to me. I tried to borrow this material from Purdue University (West Lafayette, Indiana, United States of America) four times in 2007–2008 and was told each time that it will be mailed. However, neither specimens nor loan documents arrived in the USNM so I was surprised when a newly hired collections manager inquired in 2013 (and another one again in 2014) about the material. Our research showed that the requested specimens were mailed on 23 April 2008 but not delivered to the USNM. It is unknown at present whether the box has been lost in the mail or was delivered elsewhere. Six paralectotypes of *S. commixta*, collected by F. Blanchard in Tyngsboro, are in the MCZ and were studied by me in 2012.

Distribution. *Stethobaris incompta* has a disjunct distribution in Canada. In the east, it occurs south of the Gulf of Saint Lawrence and Saint Lawrence River. The species so far is unknown along the northern shores of Lake

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Ontario and Lake Erie but it might occur there as well. Western Canada has records from British Columbia to Saskatchewan except from the Great Plains. The gap between the western and eastern populations corresponds to the extent of the Laurentide Ice Sheet around 10 000 BC. The record from Jans Bay in Saskatchewan, at 55°N, represents the most northern find of any orchid weevil worldwide. In the United States of America, *S. incompta* occurs in the northeast (Connecticut, District of Columbia, Maryland, Michigan, New Jersey, New York, Ohio, Pennsylvania, Rhode Island), southeast (Alabama, Arkansas, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Virginia, West Virginia), southwest (Oklahoma, Texas), northwest (Oregon, Washington), and central-north (Kansas, Missouri, North Dakota).

Natural history. The scarce information presently available stems almost entirely from orchid studies. Charles Dury (Blatchley and Leng 1916) is said to have bred this weevil (described as *S. commixta*) in July from a species of *Corallorhiza* Gagnebin found in Balsam, North Carolina. However, this date appears rather early for the emergence of a specimen of the new generation. The reported host is, so far, the only record associating this weevil with an orchid in Epidendroideae. The following verified host associations all apply to Orchidoideae. Sieg and O'Brien (1993) reported an association with *Platanthera praeclara* Sheviak and Bowles in a North Dakota tall-grass prairie. Their specimens (identified as *S. commixta*) were found in partially consumed flower buds during a study of the federally listed threatened host plant. Numerous independent observations (TAMU, label data) made in prairie habitats in Arkansas, Oklahoma, and Texas indicate that the weevil occurs also on species of *Spiranthes* Richard. The associations in Texas with *Spiranthes cernua* (Linnaeus) Richard, *S. parksii* Correll, and *S. vernalis* Engelmann and Gray were ascertained during a study of the endemic, federally listed threatened *S. parksii* (Navasota ladies tresses).

Material examined. British Columbia: Leanchoil, 30.v.1991, B.F. and J.L. Carr (CNCI, one specimen); Revelstoke, 15.v.1990, B.F. and J.L. Carr (CNCI, one specimen); Gabriola, 10.iv. 1988, 2.vi.1991, B.F. and J.L. Carr (CNCI, two specimens). Alberta: Township 39 Range 7 W. 5 Meridian, 18.v.1992, B.F. and J.L. Carr (CNCI, one specimen); Ghost Dam, 10.vi.1980, 11.vi.1980 (two specimens), 13.vi.1980, 25.v.1983, 1.vi.1992, B.F. and J.L. Carr (CNCI, six specimens); Calgary, 24.vi.1964, 2.vi.1968, B.F. and J.L. Carr (CNCI, two specimens). Saskatchewan: Road 965, 14 km W junction road 155, 1.viii.1986, B.F. and J.L. Carr (CNCI, one specimen). Ontario: Ottawa, Mer Bleue bog, 30.iv.1982, L. LeSage (CNCI, one specimen). Québec: Mont Orford, Sherbrooke County, 30.vi. 1984, Larochelle and Larivière (CNCI, one specimen); Ormstown, 8.vii.1983, E.J. Kiteley (CNCI, one specimen). New Brunswick: Bathurst, 9.vii.1939, W.J. Brown (CNCI, one specimen); Kouchibouguac National Park, 26.vi.1977, D.M. Wood (CNCI, one specimen).

Stethobaris sacajaweae Prena, new species

Diagnosis. *Stethobaris sacajaweae* is a western species with slightly depressed and moderately punctate elytral interstriae. This and the usually pronounced sheen separate *S. sacajaweae* from *S. incompta* in western Canada and from *S. egregia* in the southwestern United States of America. The penis is apically convex in *S. sacajaweae* (Fig. 9) and slightly notched in *S. incompta* and *S. egregia*. Other morphologically similar species occur throughout the Neotropics (among them the type species of *Montella* Bondar) but have flat or convex interstriae.

Description. Body oblong-oval, convex, subglabrous, shiny with obsolete micropunctation at 40× magnification; colour piceous (nearly black). Rostrum as long as pronotum, moderately curved in lateral view, not distinctly sexually dimorphic. Antenna inserted at midlength of rostrum, funicle stout, antennomere 1 as long as next three, antennomeres two to seven short, progressively wider towards club; antennal club moderate, oval, in both sexes as long as preceding six antennomeres; prothorax 1.24–1.29× as wide as long, sides gradually converging in basal half and then abruptly curved inward to subapical constriction. Pronotal disc with punctures slightly smaller than those in elytral striae, punctures coarser and denser on flank but well defined and not confluent to ridges. Scutellum rectangular. Elytra 1.20–1.23× as wide as prothorax, humeral callus moderately developed, striae coarse and

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deep, with edges not crenulate-punctate except near base, interstriae concave in cross-section, finely (on disc) to moderately (towards flank) punctate, male interstria 9 with distal three to four punctures modified to continuous sulcus; metepisternum with punctures dense. Tarsal claws divergent and basally separate, of equal length. Aedeagus as in Figure 9; total length (without rostrum) 2.9–3.2 mm, standard length (without head) 2.7–3.0 mm, width 1.6 mm.

Distribution. *Stethobaris sacajaweae* occurs on the Pacific side of the Rocky Mountains, from British Columbia south to California, United States of America.

Natural history. Elwood Zimmerman collected two specimens from *Corallorhiza maculata* (Rafinesque) Rafinesque in Ridge, California (label data).

Type material. Holotype: Female, labelled "Salmon Arm / BC 1933 / Smith" (CNCI). Paratypes 10 (five males, five females): California: Challenge, Yuba County, 28.v.1963, E.E. Ball (AMNH, one male, one female); California: Challenge, Yuba County 7.vi.1963 (AMNH, one female; CWOB, two females); 7.5 miles NE Alexander Valley, Pine Flat Road, Sonoma County, 5.v.1967, W. Gagné (CWOB, one female); Ridge, Mendocino, 1.v.1933, E. Zimmerman (USNM, two males); Yosemite, 17.v.1928, E. Zimmerman (USNM, one male); Bridgeville, 20.vi.1959, Kelton and Madge (CNCI, one male); Forest Grove, Washington County, 19.iv.1918, L.P. Rockwood (USNM, one female); Washington: Thurston County, Grand Mound, 5.iv.1930, W. Baker (USNM, one female).

Etymology. The epithet is a patronym given in memory of Sacajawea ("Bird Woman" in the language of the Hidatsa tribe that abducted her as a child), a courageous Shoshone woman who was recruited by the Lewis and Clark Expedition in 1804. Clark later adopted her two children.

Key to the orchid weevils found in Canada

1. Antennal club confluent with funicle, basal antennomere much longer than distal antennomeres combined, sutures distinct; pygidium with transverse carina, ventral section vertical and not covered by elytra; prosternum without anterior depression; male mesotibia with ventromedian projection; occasionally on imported orchid cultivars, not established . . . . . ***Orchidophilus aterrimus* (Waterhouse)**
— Antennal club ovate and separated from funicle, basal antennomere at most indistinctly longer than distal antennomeres combined, sutures usually more or less obliterated; pygidium without transverse carina, entirely concealed underneath elytra; prosternum with subtriangular anterior depression; male mesotibia without ventromedian projection; found in natural habitats and in greenhouses; ***Stethobaris*** 2

2. Length < 2.0 mm; native in Central America, not established in Canada (found in greenhouses before 1940) . . . . . ***S. laevimargo* (Champion)**
— Length 2.5–3.4 mm, found in Canadian natural habitats 3

3. Body subrhomboidal in dorsal view, sides of pronotum and elytron more gradually narrowed, elytral disc highly arched in lateral view (Figs. 1–2); penis ~2.3× as long as wide, apex pointed, internal sac with large denticles (Fig. 7) . . . . . ***S. ovata* (LeConte)**
— Body elliptic in dorsal view, sides of pronotum and elytron more roundly narrowed, elytral disc moderately arched in lateral view (Figs. 3–6); penis ~3.0× as long as wide, apex blunt, internal sac without large denticles 4

4. Elytral interstriae flat or convex in cross section (particularly on declivity); male interstria 9 with distal punctures not amalgamated to short grove; penis apically slightly notched (Fig. 8); British Columbia to Saskatchewan and southeastern Ontario to New Brunswick . . . . . ***S. incompta* Casey**
— Elytral interstriae medially depressed, concave in cross section; male interstria 9 with distal punctures amalgamated to short groove; penis apically convex (Fig. 9); British Columbia . . . . . ***S. sacajaweae* Prena**

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https://doi.org/10.4039/tce.2016.56 Published online by Cambridge University Press

Acknowledgements

Thanks are due to Bob Anderson (CMNC), Pat Bouchard (CNCI), Lee Herman (AMNH), Henry Hespenheide (Los Angeles, California, United States of America), the late Anne and Henry Howden (CMNC), Charlie and Lois O'Brien (CWOB), Phil Perkins (MCZ), Ed Riley (TAMU), Paul Skelley (Gainesville, Florida, United States of America), and Jim Wappes (San Antonio, Texas, United States of America) who provided specimens or access to them. Pat Bouchard also helped find field observations made by the late John Carr of Calgary, Alberta. Rick Westcott (Salem, Oregon, United States of America) was very kind and searched for specimens in the collection of the Oregon State Department of Agriculture, Salem. I also acknowledge the immensely useful contribution of ecological data by the community of orchid researchers, such as Robert Dressler, Marilyn Light, Michael MacConaill, Joyce and Allan Reddoch, and Ryan Walsh, even though they (understandably) may not be particularly fond of orchid-eating weevils. Two reviewers and the subject editor provided thoughtful comments.

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https://doi.org/10.4039/tce.2016.56 Published online by Cambridge University Press