Revision of species of the "Oligia" semicana group (Lepidoptera: Noctuidae) with descriptions of a new genus and 12 new species

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The Canadian Entomologist 134: 157 - 191 (2002)

Abstract-The name Neoligia gen.nov. is proposed for the "Oligia" semicana (Walker) species group in North America and 12 species, N. rubirena sp.nov., N. pagosa sp.nov., N. hardwicki sp.nov., N. inermis sp.nov., N. invenusta sp.nov., N. albirena sp.nov., N. lancea sp.nov., N. elephas sp.nov., N. lillooet sp.nov., N. surdirena sp.nov., N. canadensis sp.nov., and N. atlantica sp.nov. are described. Hadenella laevigata Smith is synonymized (synonymy restored) under Hadena tonsa Grote and Hadena hausta Grote is synonymized (synonymy restored) under Miana semicana Walker. Adults of all species are illustrated as well as male and female genitalia, where known.²

Troubridge JT, Lafontaine JD. 2002. Révision des espèces nord-américaines du groupe "Oligia" semicana (Lepidoptera : Noctuidae), et description d'un genre nouveau et de 12 nouvelles espèces. The Canadian Entomologist 134 : 157-191.

Résumé—Le genre Neoligia gen.nov. est proposé pour le groupe d'espèces "Oligia" semicana (Walker). Ce genre inclue 12 espèces, N. rubirena sp.nov., N. pagosa sp.nov., N. hardwicki sp.nov., N. inermis sp.nov., N. invenusta sp.nov., N. albirena sp.nov., N. lancea sp.nov., N. elephas sp.nov., N. lillooet sp.nov., N. surdirena sp.nov., N. canadensis sp.nov. et N. atlantica sp.nov. Hadenella laevigata Smith et Hadena tonsa Grote sont synonymiques (synonymie restaurée). Hadena hausta Grote et Miana semicana Walker sont également synonymiques (synonymie restaurée). Nous illustrons les adultes de toutes les espèces de même que les organes génitaux males et femelles si possible.

Introduction

While studying the species of the "Oligia" semicana (Walker) species complex in North America, we found that none of the North American species associated with Oligia Hübner belongs to Oligia as defined by European workers (e.g., Fibiger and Hacker 1991). Further, it became evident that "Oligia" semicana species group was not congeneric with any of the other European genera in this complex, namely Mesoligia Boursin and Mesapamea Heinicke. We provide a brief synopsis of these European genera and propose a new genus for the species of the semicana group. The generic placement of the other species of "Oligia" in North America is beyond the scope of this

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² The adult and genitalia plates, reproduced here in black and white, are available in color from the Canadian Biodiversity Information Facility Web site (http://www.cbif.gc.ca/neoligia/index.html).

paper. We synonymize Hadenella laevigata with Hadena tonsa, Hadena hausta Grote with Miana semicana Walker, and place Hadena tonsa, Hadenella subjuncta, Hadena exhausta Smith, Procus crytora Franclemont, and Miana semicana in Neoligia gen.nov. We review the 5 Nearctic species of Neoligia and describe 12 new species.

In the west, *N. invenusta* **sp.nov.** and *N. tonsa* are the species most frequently collected, with the other species varying from uncommon to exceedingly rare. In the east, only *N. exhausta* (Smith) is commonly collected, although *N. subjuncta* and *N. canadensis* **sp.nov.** can be locally common in parts of eastern Canada. The species are often superficially similar and difficult to separate by wing markings alone. This problem is compounded by the extreme individual and geographic variation found in several of the species. Males can be identified without dissection by brushing the scales from the genitalia and examining the valves of pinned specimens, but females frequently can not be identified without dissection.

Materials and methods

Repository abbreviations

Specimens were examined from the following collections:

AMNH	American Museum of Natural History, New York, United States.
BMNH	Natural History Museum, London, United Kingdom.
CNCI	Canadian National Collection of Insects and Arachnids, Ottawa, Canada.
CSUC	CP Gillette Arthropod Biodiversity Museum, Colorado State University,
	Fort Collins, Colorado, United States.
JTT	Personal collection of James T Troubridge, Langley, British Columbia, Canada.
LGC	Personal collection of Lars G Crabo, Bellingham, Washington, United States.
USNM	National Museum of Natural History, Washington, District of Columbia,
	United States.

Dissection of genitalia and terminology for genital structures and wing markings follows that of Lafontaine (1987).

Generic classification

The genus Oligia Hübner [1821] included five species with Phalaena strigilis Linnaeus as the type species (Nye 1975). The genus Miana Stephens is an objective synonym of Oligia because it has the same type species as Oligia; the genus Procus Agassiz is a subjective synonym as its type species, Noctua latruncula [Denis and Schiffermüller], is considered to be congeneric with Oligia strigilis. Hampson (1908) had a broad concept of Oligia, basing the genus only on externally visible characters, and included 46 species. Forbes (1954) had a similar generic concept to that of Hampson and included 13 eastern North American species in Oligia. Both Hampson and Forbes placed Oligia in the subfamily Acronyctinae, which was characterized as "trifid" noctuids (i.e., cubital vein appearing to branch into three veins on the hind wing) that lack sclerotized setae on the tibiae, tufts of hairlike setae in front of the eyes, and surface hairs on the eyes. This subfamily definition based almost entirely on the absence of derived characters resulted in a subfamily with a heterogeneous assemblage of genera lumped together. Franclemont and Todd (1983) retained this subfamily concept except that Acronicta Ochsenheimer and several other genera were segregated into their own subfamily, and the subfamily name Amphipyrinae was used for the collection of genera that included Oligia. Fibiger and Hacker (1991), in a check list of the Noctuidae

of Europe, used the subfamily name Ipimorphinae for this group of genera, removing the genus *Amphipyra* Ochsenheimer from this assemblage of genera and placing it in the Cucullinae. Kitching and Rawlins (1999) used a broad subfamily definition for this group and combined large portions of the subfamilies Hadeninae, Amphipyrinae, and Cucullinae of Franclemont and Todd (1983) into a single more inclusive subfamily Hadeninae. The subfamily Hadeninae (*sensu* Kitching and Rawlins 1999) is a large group, but it appears to be a natural grouping of genera and provides a framework for future work on the higher classification of trifid noctuids. In the present study we include the *Oligia* group of genera in the Hadeninae.

Hampson (1908) and Forbes (1954) provide keys to genera of the subfamily Acronictinae, containing *Oligia*. The included genera are based on external characters, and *Oligia* is characterized mainly by its lack of derived characters (*e.g.*, no tibial spines, unmodified smooth frons, lack of tufts and crests of raised scales on the thorax). The exception to this, and the feature that basically defines the genus *Oligia*, is the presence of dorsal tufts on the first five abdominal segments with the tufts on segments three and four being larger than the others. Although this has been a functional definition of *Oligia*, examination of genitalic structures shows that a wide range of genital structural types are combined under this definition, not all of which belong even to a single tribe within the Hadeninae. The European fauna of *Oligia* (*sensu* Hampson 1908) is now arranged in three genera with *Oligia* containing five species, *Mesoligia* Boursin containing two species, and *Mesapamea* Heinicke containing six species (Fibiger and Hacker 1991). The North American "*Oligia*" fauna of 20 species, the African fauna of 34 species, and that of China with 6 species are still largely associated with *Oligia* by the traditional external characteristics.

The genus *Oligia* (Fig. 33) is characterized by the elongated pollex projecting from the base of the cucullus with the apex of the pollex spatulate and setose, the digitus is prominent and projects well below the ventral margin of the valve like a dagger, the uncus is abruptly bent mesially with the basal portion modified from the apical portion (basal half curving downwards, apical half curving upwards), the vesica is unarmed except for a prominent subbasal cornutus. There are no native species of *Oligia* in the North American fauna, but an introduced population of *Oligia strigilis* has recently been discovered in the vicinity of Quebec City in eastern Canada.

The genus *Mesapamea* (Fig. 34) is structurally homogeneous with differences among the species consisting of differences in the shape of the clavus and in the structure of the basal cornutus in the vesica. The genitalia of the species are illustrated by Heinicke (1959). This genus is characterized by the disproportionately large paddle-like cucullus without a pollex, the narrow valve between the sacculus and the cucullus strengthened by the spine-like digitus that extends along the inner surface of the valve to the base of the cucullus, and the vesica armed only with a large basal cornutus, which in some species branches into a multi-tipped structure. No North American species are presently associated with *Mesapamea*; however, "*Oligia*" fractilinea (Grote) and its relatives are superficially and structurally close to *Mesapamea* spp. but differ in having a modified cucullus with a series of spines radiating from the proximal margin, and the vesica is unarmed. Future research on North American "Oligia" species will probably result in some of our fauna associated with *Mesapamea* spp.

Species of *Mesoligia* (Fig. 32) are characterized by lack of a distinct pollex (although the proximal margin of the cucullus may be sclerotized), the digitus is evident as a more heavily sclerotized area along the inner surface of the valve, the uncus is abruptly bent mesially with the basal portion modified from the apical portion, as in *Oligia*, and the vesica is unarmed except for a field of cornuti near the apex.

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Some species in the "Oligia" semicana group superficially resemble species of *Mesoligia*, but the evidence does not support their placement in this genus. The lack of a pollex on the cucullus in *Mesoligia*, and the lack of a basal cornutus in the vesica, could be taken as possible species group characteristics, but both *Mesoligia* and *Oligia* (*s.s.*) are associated with each other by a uniquely derived character state, namely the highly modified uncus in which the apical half is differentiated from the stem-like basal half (Figs. 32, 33, inserts). The association of *Oligia* and *Mesoligia* as sister genera by a character unknown in the North American fauna requires us to exclude the *semicana* group from either of these genera.

For reference, the type species of Oligia Hübner [1821] (Phalaena strigilis Linnaeus, Fig. 33) and Mesoligia Boursin 1965 (Noctua furuncula [Denis and Schiffermüller], Fig. 32) are illustrated. The type species of Mesapamea Heinicke (Apamea moderata Eversmann) is structurally close to that of Mesapamea secalis (Linnaeus), which we illustrated in Fig. 34. Mesapamea secalis differs from M. moderata in having a more rounded spinose clavus (Heinicke 1959: 105).

Neoligia, gen.nov.

Type species

Hadenella subjuncta Smith 1898.

Note

We select *Hadenella subjuncta* as type species because it is the most widely distributed species in the genus and one of the most easily identified.

Gender

Feminine.

Etymology

Neoligia is derived from the Greek words *neo* and the generic name *Oligia* and refers to this being a new relative of *Oligia*.

Diagnosis

The genus *Neoligia* is characterized by the presence of a tapered smooth pollex on the ventral margin of the cucullus (spatulate and setose of the genus *Oligia*, pollex absent in the genera *Mesapamea* and *Mesoligia*); a plate-like digitus fused to the inner surface of the valve and without a projecting process (digitus daggar-shaped and projecting below the ventral margin of the valve in the genus *Oligia*; digitus spine-like and extended to cucullus in the genus *Mesapamea*; digitus vestigial in the genus *Mesoligia*); clasper reduced to a thin rod with a small weakly sclerotized setose ampulla; aedoeagus smooth apically (*i.e.*, without the two rounded apical patches of curved posteriorly projecting spines in the genera *Oligia* and *Mesoligia*); vesica with a large basal cornutus (also in the genus *Oligia*); vesica with a field of small cornuti near the apex (also in the genus *Mesoligia*). Most species of *Neoligia* are relatively small moths with slight bodies and are sometimes mistaken superficially for species in the Geometridae.

Description

Head. Antenna of male and female filiform, ciliate ventrally; haustellum unreduced; eye smooth, round, without surface hair; labial palpus with second segment clothed with broad spatulate scales, these longer ventrally forming a roughened ventral fringe; third segment smoothly scaled, slightly roughened ventrally and apically; third segment about three times as long as wide when denuded (appearing about two times as long as wide with scales and half as long as second segment); frons smooth and rounded centrally; clothed with broad spatulate scales; a tuft of spatulate scales on occiput projecting forward between bases of antennae and forming tuft overtopping frons; a row of hairlike scales posterior to eye but none anterior to eye or at base of antenna. Thorax. Prothoracic collar smoothly scaled with spatulate scales; mesothorax and metathorax clothed with spatulate scales with raised central tuft on mesothorax and spreading somewhat divided tuft on metathorax. Legs: tibia without sclerotized setae or spines; tarsi with three ventral rows of setae on each segment. Abdomen. Base of abdomen with fully developed coremata brushes with levers and pockets in semicana species group (except N. crytora), or brushes absent and pockets reduced to elongated folds in sternites 3 and 4 in tonsa species group; abdomen cylindrical, clothed with short broad setae overlaid with layer of long hairlike setae; dorsal tufting present on first five segments with tuft on segments 1 and 3 similar in size; tuft on segment 4 largest; tufts on segments 2 and 5 smaller. Male genitalia. Uncus cylindrical, down-curved from base to apex, middle portion clothed with long hairlike setae, middle or apical portion larger, appearing swollen compared with basal and apical portions; apex of uncus tapered to sharp point; tegumen raised dorsally into hump at base of uncus, extended laterally into high rectangular flaps posteriorly; pleural sclerite joining tegumen to vinculum a double helix with one element formed into large plate for muscle attachment along posterior margin of tegumen; saccus U-shaped; transtilla a narrow sclerotized band laterally; juxta shield-shaped, posterior margin convex and lightly sclerotized; valve generally upcurved with ventral margin convex, dorsal margin concave; sacculus about one third length of valve, extended dorsally near base into heavily sclerotized clavus-like process; surface of process varying among species from rounded to pointed and smooth to spiny; dorsal margin of valve sharply angled in *subjuncta* and *exhausta*, evenly curved in other species; central portion of valve generally narrow compared with wide sacculus and wide cucullus; cucullus triangular to rectangular, well differentiated from remainder of valve by heavily sclerotized band along a fold on proximal margin of cucullus that extends below margin of valve at anteroventral edge of cucullus into pointed pollex (in most species the pollex forms a long spine); a single row of stouter setae forms corona along outer margin of cucullus in some species, but corona reduced or absent in other species; digitus a broad sclerotized plate fused to middle of inner surface of valve and extended underneath folded margin of cucullus; clasper a thin sclerotized rod on inner surface of valve one third from ventral margin of valve and parallel to it, extending from distal margin of sacculus two thirds distance to base of cucullus, with small lightly sclerotized setose ampulla on dorsal margin three quarters from base of clasper; editum an elongated setose ridge dorsal to ampulla of clasper and half as long as clasper; aedoeagus straight, five to six times as long as wide; apex of aedoeagus smooth; vesica about as long as aedoeagus, curling ventrally through 180° to project anteriorly, generally parallel to aedoeagus; vesica with sclerotized band on basal half of vesica supporting moderately large cornutus (some species with second band supporting second cornutus); vesica with field of cornuti near apex, cornuti small and inconspicuous (e.g., N. subjuncta, Fig. 18) to long and prominent (e.g., N. canadensis, Fig. 22); some species with short diverticulum on surface of vesica. Female genitalia. Bursa copulatrix unisaccate, with corpus bursae either oval, tapered posteriorly, or constricted postmesially and shaped like "a number 8"; posterior portion of corpus bursae sclerotized and extended posteriorly to left of junction with bursa shaped with ductus seminalis at apex of extension; corpus bursae without signa in most species but signa, or traces of a signum in three species (*i.e.*, *N. invenusta*, *N. lillooet* **sp.nov.**, and *N. crytora* Franclemont); ductus bursae one third to two thirds as long as corpus bursae, tapered anteriorly, generally lightly sclerotized but more heavily sclerotized in some species, especially along left side and over slightly wider ostium bursae at posterior end of ductus; abdominal segment 8 generally about half as long as anterior and posterior apophyses; papillae anales dorsoventrally flattened, like all Apameini, inner margins parallel, concave mesially, or slightly diverging posteriorly; outer margins convex; apex of papilla analis tapered to a point posteriorly in some species but blunt and rounded posteriorly in most species; papilla covered with minute setae.

Species in the genus *Neoligia* (Appendix A) can be arranged in two species groups. The *N. semicana* group (*semicana, canadensis, atlantica* sp.nov., *exausta, subjuncta, inermis, pagosa* sp.nov., *hardwicki* sp.nov., *surdirena* sp.nov., and *crytora*) is characterized by the oval corpus bursae, the presence of fully developed coremata brushes and pockets at the base of the abdomen in males and the broad cucullus with a well-developed corona of stout setae along the outer margin. We tentatively include *N. crytora*, which has highly modified valves and no coremata, on the basis of the adult habitus and the female genital characters, and *surdirena*, in which the corona is reduced (no male abdomen was available to determine the presence or absence of coremata). The *N. tonsa* group (*tonsa, rubirena* sp.nov., *invenusta, elephas* sp.nov., *albirena* sp.nov., *lancea* sp.nov., and *lillooet*) is characterized by the postmedial constricted corpus bursae, like "a number 8," the coremata are absent and the associated pocket is vestigial, reduced to a fold along each side sternites 3 and 4, and the cucullus is narrow with the apical corona reduced to fine hair-like setae.

Key to species of the genus Neoligia

1.	Anal dash present (Fig. 10) [eastern North America]
_	Anal dash absent
2.	Forewing various shades of gray, black or brown distal to postmedial line; if area distal to the
	postmedial line pale and contrasting with area basal to it, then costa pale; distal margin of reniform
	spot without contrasting black dots
	Forewing dark basal to postmedial line and on costa distal to postmedial line contrasting with whitish-
	gray area distal to line below costa; reniform spot with two distinct black dots adjacent to distal margin
	(Fig. 9) [eastern North America]
3.	Reniform spot reddish orange; forewing mesial band brownish (Fig. 3); ostium bursae with deep ven-
	tral notch (visible without dissection) (Fig. 36) [male unknown; Arizona] N. rubirena
-	Reniform spot without orange scales; forewing mesial band brown, gray, or black; ostium bursae with-
	out deep ventral notch
4.	Spine at base of cucullus (pollex) short, projecting anteriorly parallel to ventral margin of valve
	(Fig. 29); hind wing silvery gray (Fig. 13); appendix bursae bisected by ventral notch, left chamber
	much larger than right (Fig. 48) [southern British Columbia]
_	Spine at base of cucullus projecting ventrally or anteroventrally away from ventral margin of valve;
	hind wing light gray brown; appendix bursae usually entire, if bisected by ventral notch then right and
	left chambers similar in size (Fig. 47)
5.	Male valves asymmetrical, left cucullus shorter than right; ventral spine at base of cucullus relatively
	short, not curved (Fig. 26); lower corner of reniform spot usually splayed towards outer margin
	(Fig. 6e) [western United States and southwestern Canada].
	Male valves more-or-less symmetrical, if asymmetrical ventral spine long and curved (Fig. 23); top half
	of reniform spot about equal to lower half
6.	Corpus bursae and appendix bursae separated by a constriction of corpus bursae; ventral spine at base
	of cucullus relatively long, at least as long as width of valve at base of cucullus

	Corpus bursae tapered evenly to appendix bursae, not separated by a constriction of corpus bursae; ven-
	tral spine at base of cucullus absent, or much shorter than width of valve at base of cucullus 10
7.	Male valves asymmetrical, left cucullus shorter than right (Fig. 23) [female unknown; Arizona]
	\cdots
_	Male valves more-or-less symmetrical
8.	Cucullus evenly rounded apically (Fig. 24); ductus bursae with sclerotized longitudinal ridges
	(Fig. 37); forewing with slightly hoary appearance (Figs. 4a-4f) [southern British Columbia and west-
	ern United States]
****	Cucullus truncated apically; ductus bursae without sclerotized longitudinal ridges; forewing with
	smooth appearance
9.	Cucullus longer than wide; spine at base of cucullus directed anteriorly (Fig. 27); reniform and orbicu-
	lar spots usually equally distinct; appendix bursae evenly bisected by ventral notch (Fig. 47) [northern
	Great Basin]
	Cucullus about as long as wide; spine at base of cucullus directed ventrally (Fig. 25); white scales
	within reniform spot contrasting with dark forewing [specimens from Utah with pale forewing
	(Figs. $5a-5b$), often with contrasting black mesial band (Fig. $5a$)]; appendix bursae entire, not bisected
10	ventrally (Fig. 42) [southern British Columbia and western United States] N. albirena
10.	Reniform spot usually distinct; medial area of forewing without reddish-brown scales, or basal area of
	wing darker than postmedial area; basal portion of valve wider than apical portion
_	Reminorm spot smudged, indistinct; basal and postmedial areas of forewing pale gray, contrasting with
	(Fig. 28) [Arizona and New Mavica]
11	Forewing light gray with merial hand below claviform spot black: nostmedial line broad white
112	(Fig. 1): hind wing lighter than forewing with black terminal line: long narrow pointed sclerites located
	ventrally between ovinositor lobes (Fig. 40) [male unknown: Colorado]
	Not as above.
12.	Forewing and hind wing gray brown: hind wing similar to forewing in color, not distinctly paler
	(Fig. 14): ostium bursae with evenly curving ventral notch; ductus bursae with pouch on left side
	(Fig. 44) [male unknown; southern Utah]
_	Not as above
13.	Claviform spot blended into distinct black bar that extends from antemedial line to postmedial
	line (Fig. 8); cucullus of male valve evenly rounded from costa to posteriorly directed spine on
	ventral margin; vesica with twin subbasal thorn-like cornuti (Fig. 21) [females unknown; Atlantic
	Canada]
	Not as above.
14.	Cucullus of male valve truncated apically with ventral shoulder rounded; minute spine on swelling at
	ventral base of cucullus; vesica with single subbasal thorn-like cornutus (Fig. 22); bursa copulatrix
	heart-shaped, shoulder on right side projects at 90° from ductus bursae (Fig. 43) [central Canada]
	a a a a a a a a a a a a a a a a a a a
_	Cucullus of male valve evenly rounded from costa to spine on ventral margin; vesica with single thorn-
16	like cornutus; bursa copulatrix oblong or rounded with no distinct shoulder on right side 10
10.	Spine at base of cucultus absent (Fig. 19); bursa copulatrix ellipsoidal (Fig. 41) [Arizona and New
	NICALCUJ
17	For a base of cucultus present out short, corpus oursal obtoing of founded
17.	consistent rounded (Fig. 39) [coast to coast in Canada: northern United States southward in west to
	Colorado and Arizonal
_	Forewing appears gravish brown: spine at base of cucullus directed anteriorly (Fig. 20): bursa
	copulatrix oblong (Fig. 46) [New England westward to Ohio]

Neoligia semicana (Walker), comb.nov. Figs. 16, 20, 46

Miana semicana Walker 1865a: 675. Holotype male BMNH, London [examined by M Honey].

Hadena semicana (Walker); Smith 1893: 144; Dyar 1902: 116.



FIGURES 1–6. Adults of the genus *Neoligia*. 1, *N. pagosa*, Pagosa Springs, Colorado. 2, *N. inermis*: (a) \circ , Graham Mts., Arizona; (b) \circ , Santa Catalina Mts., Arizona. 3, *N. rubirena*: \circ , White Mts., Arizona. 4, *N. invenusta*: (a) \circ , Mt. Kobau, British Columbia; (b) \circ , Junior Pt., Chelan Co., Washington; (c) \circ , Bethel Ridge, Yakima Co., Washington; (d) \circ , Mt. Kobau, British Columbia; (e) \circ , Mt. Kobau, British Columbia; (e) \circ , Mt. Kobau, British Columbia; (f) \circ , Drake Peak, Warner Mts., Oregon. 5, *N. albirena*: (a) \circ , Stockton, Utah; (b) \circ , Lee Vining, California; (c) \circ , Lillooet, British Columbia; (d) \circ , Lillooet, British Columbia; (e) \circ , Lillooet, British Columbia; (f) \circ , Torga Pass, California.



FIGURES 7–17. Adults of the genus *Neoligia*. 7, *N. subjuncta*: (a) \checkmark , Milk River, Alberta; (b) \updownarrow , Thunder Bay, Ontario; (c) \updownarrow , Campbell River, British Columbia. 8, *N. atlantica*: \checkmark , Gander, Newfoundland. 9, *N. crytora*: \checkmark , Pike Lake, Manitoulin Island, Ontario. 10, *N. exhausta*: (a) \circlearrowright , Sharbot Lake, Ontario; (b) \checkmark , Endfield, Maine. 11, *N. surdirena*: \checkmark , Sandia Mts., New Mexico. 12, *N. lancea*: (a) \backsim , Mt. Kobau, British Columbia; (b) \circlearrowright , Alkali Lake, Lake Co., Oregon. 13, *N. lillooet*: (a) \circlearrowright , Lillooet, British Columbia; (b) \circlearrowright , Norway Bay, Québec. 16, *N. semicana*: \diamondsuit , Oak Station, Pennsylvania. 17, *N. elephas*: \checkmark , Apache National Forest, Greenlee Co., Arizona.

Oligia semicana (Walker); Hampson 1908: 390; McDunnough 1938: 88; Franclemont and Todd 1983: 138; Poole 1989: 724.

Erastria latireptana Walker 1865b: 791; Smith 1893: 144 [= *semicana*]. Holotype male BMNH, London [examined by M Honey]. Note that the "female" holotype of



FIGURES 18–21. Male genitalia of the genus Neoligia. 18, N. subjuncta. 19, N. inermis. 20, N. semicana. 21, N. atlantica.

latireptana is a male. The dissected female abdomen is that of a different species that had been glued onto the holotype before dissection and is thus spurious.

Oligia latireptana (Walker); Hampson 1908: 390 [= semicana].

Hadena hausta Grote 1882: 217. Holotype male MCZ, Boston [photographs examined]. Oligia hausta (Grote); Hampson 1908: 390 [= semicana]; Schweitzer, 1984 [valid species];

Rings et al. 1992.

Type locality

North America (semicana); North America (latireptana); Kittery Point, Maine, United States (hausta).



FIGURES 22–25. Male genitalia of the genus Neoligia. 22, N. canadensis. 23, N. elephas. 24, N. invenusta. 25, N. albirena.

Diagnosis

Externally, *N. semicana* is similar to eastern forms of *N. canadensis*. In *N. canadensis*, the antemedial line is more deeply curved than that of *N. semicana*, which runs more or less parallel with the postmedial line through the fold. Internally, the cucullus of the male valve of *N. semicana* is evenly rounded from the costa to the ventral spine, whereas the cucullus of *N. canadensis* is more or less square. The ventral spine on the

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FIGURES 26-29. Male genitalia of the genus Neoligia. 26, N. tonsa. 27, N. lancea. 28, N. surdirena. 29, N. lillooet.

valve of *N. canadensis* is minute and projects ventrally from a distinct swelling; that of *N. semicana* is much larger and follows the angle of the cucullus, projecting anteriorly.

Range

Neoligia semicana is a rare species of northeastern United States where it occurs from southern Maine westward to Ohio and southward to Pennsylvania.



FIGURES 30-31. Male genitalia of the genus Neoligia. 30, N. exhausta. 31, N. crytora.

Note

Schweitzer (1984) distinguished "Oligia" hausta from the Canadian Zone species that he referred to as O. semicana. The type specimen of semicana is conspecific with hausta so the northern species is described below as canadensis, and references to hausta as a possible endangered species in parts of New England are now referred to semicana, which is not the semicana of recent authors (e.g., Handfield 1999).

Neoligia canadensis, sp.nov.

Figs. 15a–15b, 22, 43

Oligia semicana of authors, not Walker 1865a.

Type locality

Norway Bay, Québec, Canada.

Type material

Holotype male: CANADA. Québec: Norway Bay, 29.vi.1938, EG Lester (CNCI). Paratypes $(3\sigma, 2\mathfrak{P})$: CANADA. Québec: Kazubazua, 25.vi.1936, FA Urquhart $(1\mathfrak{P}, \text{CNCI})$; Manitoba: Wasagaming, Riding Mtn. Natl. Park, 19.vii.1979, 2000' [600 m], JD Lafontaine $(3\sigma, 1\mathfrak{P}, \text{CNCI}, \text{JTT})$.

Etymology

Presently, *N. canadensis* is known only from central and eastern Canada, hence the name.

Diagnosis

Neoligia canadensis is superficially similar to *N. atlantica* and *N. semicana*. They are most easily separated by range (Atlantic Canada = N. *atlantica*; central Canada =

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FIGURES 32-34. Male genitalia. 32, Mesoligia furnuncula. 33, Oligia strigilis. 34, Mesapamea secalis.

N. canadensis; New England = *N. semicana*); however, *N. atlantica* has a distinctive black bar in the fold that extends from the antemedial line to the postmedial line, much less contrasting in the other two species. In the east, *N. semicana* and *N. canadensis* are separated by the internal characters given under *N. semicana* (above); however, the antemedial line of *N. canadensis* is more deeply curved (especially through the fold) than that of *N. semicana*, which runs parallel with the postmedial line. In the western portion of its range, *N. semicana* is lighter in the basal half of the forewing and closely matches the Great Plains form of *N. subjuncta*. Here again, genital characters must be examined to separate the species. The cucullus of *N. subjuncta* is evenly excurved from the costa to the ventral spine and is not squared off as in *N. canadensis*. The ventral spine of *N. subjuncta* is much larger than that of *N. canadensis*.

Description

Males and females similar. Forewing length 10–11 mm. Antennae filiform, ciliate; scape, head, palpi, prothoracic collar, thorax, tegulae, and abdomen light brown. Dorsal



FIGURES 35–42. Female genitalia of the genus Neoligia. 35, N. tonsa. 36, N. rubirena. 37, N. invenusta. 38, N. surdirena. 39, N. subjuncta. 40, N. pagosa. 41, N. inermis. 42, N. albirena.



FIGURES 43-49. Female genitalia of the genus Neoligia. 43, N. canadensis. 44, N. hardwicki. 45, N. exhausta. 46, N. semicana. 47, N. lancea. 48, N. lillooet. 49, Neoligia crytora.

forewing ground color light buff brown; orbicular spot buff brown, edged thinly with black and an inner ring of white scales; reniform spot light gray brown in basal one third, off-white in distal two thirds, edged thinly with dark brown scales on basal Volume 134

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margin; triangular claviform spot black; basal dash absent; antemedial line double, black distally, white basally, more or less evenly excurved; mesial band brown below, light buff brown above claviform spot; postmedial line double, black basally, white distally, becomes obscure above M3; cubital veins thinly edged with black scales through subterminal area; obscure subterminal line light buff; terminal line brown; fringe a series of short and long scales, both rows light brown tipped with dark brown, darker between veins giving a checkered appearance. Dorsal hind wing light buff with faint, light brown median, postmedial, and subterminal lines; dark brown terminal line crisp; fringe a double row of off-white scales, shorter row tipped with dark brown. Male genitalia (Fig. 22). Cucullus squared-off distally with dorsal and ventral corners at about 90°, corona well developed along posterior margin. Anterior margin of cucullus folded medially to form a sclerotized blade-like ridge that runs from costa to ventral margin, terminating in a square process with a minute spine protruding ventrally from posterior corner. Clavus elongate, bent towards aedoeagus, squared-off. Uncus widens gradually towards apex then abruptly narrows subapically. Vinculum with enlarged pointed (about 55°) lateral flaps. Aedoeagus with long, dorsally projected, subbasal bulbous cornutus from bulbous base. Vesica bends ventrally with posterior, median diverticulum and patch of slender subapical cornuti. Female genitalia (Fig. 43). Ovipositor lobes bluntly rounded, curve ventrally. Ductus bursae sclerotized with narrow longitudinal ridges. Bursa copulatrix heart-shaped with signa absent. Lightly sclerotized appendix bursae arises from left anterior bursa copulatrix.

Distribution and habitat

Neoligia canadensis has been collected in open pine forests with sandy soil from southern Québec to central Manitoba.

Neoligia atlantica, sp.nov.

Figs. 8, 21

Type locality

Gander, Newfoundland, Canada.

Type material

Holotype male: CANADA. Newfoundland: Gander, 12.vii.1949, RA Hannigar (CNCI).

Etymology

The name refers to the Atlantic distribution of this species.

Diagnosis

The forewing of *N. atlantica* is light gray brown with paler orbicular and reniform spots and a distinctive black bar crossing the mesial band below the orbicular spot. Males are separated from the other species by the vesica, which has two spine-like subbasal cornuti.

Description

Forewing length 10 mm. Antennae filiform, ciliate; scape, head, palpi, prothoracic collar, thorax, tegulae, and abdomen light gray brown. Dorsal forewing ground color

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light gray brown, orbicular and reniform spots pale gray; claviform spot blended into a black bar in that extends from antemedial line to postmedial line; antemedial line whitish gray, slightly concave; anal vein edged with white scales within mesial band; postmedial line whitish gray; subterminal area light gray brown, becoming paler and grayer below M3; veins above M3 thinly edged with black scales through subterminal area; obscure subterminal line light brown; terminal line broken to form a series of black chevrons between veins; fringe light brown. Dorsal hind wing light gray brown basally, gradually getting darker towards median line; thin median line darker gray brown basally, whitish distally; veins edged with darker scales; broad terminal band darker gray brown; fringe light gray brown. Male genitalia (Fig. 21). Cucullus enlarged, evenly excurved from costa to ventral margin with well-developed corona and sclerotized ridge running from middle of valve to form a relatively short, posteroventrally directed spine on ventral margin. Clavus bluntly rounded. Uncus thin with terminal spine. Shoulders of vinculum rounded, without enlarged, pointed lateral flaps. Saccus rounded. Vesica sack-like, bends to right with ventral, subbasal diverticulum and smaller, ventral, subapical diverticulum. Two large, thorn-like, subbasal cornuti and a subapical patch of spine-like cornuti are present. Female genitalia. Unknown.

Distribution and habitat

Neoligia atlantica is known from a single male from Gander, Newfoundland. The exact habitat is unknown.

Neoligia exhausta (Smith), comb.nov.

Figs. 10a-10b, 30, 45

Hadena exhausta Smith 1903:194. Lectotype male AMNH, New York [examined]. Oligia exhausta (Smith); Hampson 1908: 384; McDunnough 1938: 88; Franclemont and Todd 1983: 137; Poole 1989: 722.

Type locality

Schenectady, New York, United States.

Diagnosis

Neoligia exhausta is the only North American *Neoligia* with distinct anal dash on the forewing and dorsal extension of the costa on the male valve.

Range

Neoligia exhausta occurs from southeastern Canada southward to West Virginia.

Neoligia crytora (Franclemont), comb.nov.

Figs. 9, 31, 49

Procus crytora Franclemont 1950: 144. Holotype male USNM, Washington, District of Columbia [examined].

Oligia crytora (Franclemont); Franclemont and Todd, 1983: 138; Poole 1989: 722.

Type locality

New Brighton, Pennsylvania, United States.

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Diagnosis

Neoligia crytora is separated from other *Neoligia* species by the unusually notched cucullus on the male valve. Females differ from those of other eastern species in having a signum on the ventral surface of the bursa copulatrix anteriorly. Externally, it has a distinctive two-toned (black basally, white distal to postmedial line) forewing in combination with a white reniform spot and two small black spots between the reniform spot and postmedial line. The shape of the valve of *N. crytora* (Fig. 31) is different from any other species of *Neoligia*, but the habitus of the adult and vesica and female genital characters support its placement here.

Range

Neoligia crytora occurs from central Ontario southward to North Carolina; it is rarely collected.

Neoligia subjuncta (Smith), comb.nov.

Figs. 7a-7c, 18, 39

Hadenella subjuncta Smith 1898: 323. Lectotype USNM, Washington, District of Columbia [examined].

Oligia tonsa subjuncta (Smith); McDunnough 1938: 88; Franclemont and Todd, 1983: 138; Poole 1989: 724.

Oligia tonsa (Grote) syn. subjuncta (Smith); Poole 1989: 724.

Oligia subjuncta (Smith); Hampson 1908: 391; Handfield 1999: 623.

Type locality

Calgary, Alberta, Canada.

Diagnosis

Neoligia subjuncta is separated from the other species in the genus by the spine at the base of the cucullus on the male valve (Fig. 18), which is blunt. It is also the only species with a short tube-like vesica with a small subapical diverticulum and heavy subbasal spine on the left. The corpus bursae is orbicular and the appendix bursae is reduced to form a low sclerotized mound posteriorly on the left (Fig. 39). The ductus bursae is unique in having a sclerotized pouch on the right. Specimens from east of the Great Plains (Fig. 7b) are dark chocolate brown and match specimens from Vancouver Island (Fig. 7c). Specimens from the Great Plains (Fig. 7a) are much paler and match specimens from higher elevations in British Columbia and Arizona.

Range

Neoligia subjuncta occurs from Nova Scotia and Maine westward to Vancouver Island, northward to southern Northwest Territories and Alaska and south in the west through Wyoming and Colorado to the White Mountains in central eastern Arizona. It is not uncommon on the northern Great Plains but seems to be scarce elsewhere. It has been found from sagebrush steppe and grassland habitats to coniferous forests at treeline, but most commonly it is in open prairie habitats.

Neoligia inermis, sp.nov.

Figs. 2a-7b, 19, 41

Type locality

Chiricahua Mts., Arizona, United States.

Type material

Holotype male: UNITED STATES. Arizona: Cochise Co., Chiricahua Mountains, Barfoot Park, 8040 ft [2450 m], 15.viii.2001, 31.9155N, 109.2821W, UV light and traps, Peter M Jump (CNCI). **Paratypes** $(3\sigma, 6\circ)$: UNITED STATES. Arizona: Cochise Co., Chiricahua Mountains, Barfoot Park, 8040 ft [2450 m], 15.viii.2001, 31.9155N, 109.2821W, UV light and traps, Peter M Jump (1 \circ , JTT); Spider Creek Cmpgd. 9352' [2900 m], Graham Mts., Graham Co., 16.viii.1974, R & J Wielans (1 σ , USNM); Greer, White Mts., Apache Co., 8200' [2500 m], 5.viii.1986, RH Leuschner (1 σ , 1 \circ , CNCI, JTT); Pima Co., Madera Canyon, Santa Rita Mts., 15.viii.1949, CW Kirkwood (1 \circ , CNCI); Santa Catalina Mts., 20.viii.1938, Bryant Lot 21 (1 σ , USNM)"; Arizona," M Bryant (2 \circ , USNM); Paradise, Cochise Co., "Aug." (1 \circ , USNM).

Etymology

The name is Latin, means "unarmed," and refers to the absence of a spine at the base of the cucullus of males.

Diagnosis

Neoligia inermis is similar to N. subjuncta and can be separated from it by examining male or female genitalia. The ovipositor lobes of N. inermis are shorter than those of N. subjuncta, and N. subjuncta lacks the heavy basal ridge of female N. inermis (Figs. 39, 41). Male N. inermis lack the spine at the base of the cucullus, which is present in N. subjuncta and the other species of the group.

Description

Males and females similar. Forewing length 11–13 mm. Antennae filiform, ciliate; scape, head, and palpi brown; prothoracic collar with four bands: brown basally followed by a thin black line, a brown band, edged with off-white; thorax, tegulae, and dorsal tuft adjacent to abdomen brown. Dorsal forewing ground color light buff brown, orbicular spot buff brown, edged thinly with black; reniform spot buff brown edged thinly with dark brown and an inner ring of brown scales; lower corner, filled with light gray scales, extends slightly towards outer margin; claviform spot ellipsoidal, filled with rust colored scales and edged thinly with black; basal dash black; antemedial line double, black distally, brown basally, with light buff brown in center, more or less straight except within cell 1A + 2A where it turns abruptly towards base of wing at 90°; mesial band divided by a black line running through center of cell CuA2; mesial band filled with a mixture of dark brown and rust scales below and buff and rust scales above this line with darker brown above orbicular spot; postmedial line double, black basally, brown distally with buff in center, becomes obscure above M3; cubital veins thinly edged with black scales through subterminal area; obscure subterminal line light buff; terminal line black; fringe a series of short and long scales, both rows light brown tipped with dark brown, darker between veins giving a checkered appearance. Dorsal hind wing light buff with faint, light brown median, postmedial, and subterminal lines; dark brown terminal line crisp; fringe a double row of scales, both rows light brown

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tipped with dark brown. **Male genitalia** (Fig. 19). Cucullus oval, about twice as wide as sacculus, bluntly rounded with well-developed corona and sclerotized ridge running from middle of valve to form a blunt point on posterior margin. Ampulla of clasper long, slender, and weak. Clavus elongate, bent towards aedoeagus, bluntly pointed. Uncus widens gradually towards apex then quickly narrows subapically with a thin terminal spine. Vinculum with enlarged pointed (about 55°) lateral flaps. Saccus long and narrow. Aedoeagus with short dorsal terminal spine. Vesica a short narrow tube with subapical spine on right and small comb of apical cornuti. **Female genitalia** (Fig. 41). Ovipositor lobes bluntly pointed, curve ventrally with thick, sclerotized basal ridge on ventral surface. Heavily sclerotized ductus bursae widens towards ostium. Bursa copulatrix widens medially and is pointed anteriorly with signa absent. Lightly sclerotized appendix bursae reduced to form a low bump on ventral bursa copulatrix.

Distribution and habitat

Neoligia inermis has been collected at higher elevations in the Santa Catalina, Graham, and Chiricahua mountains of Arizona.

Neoligia pagosa, sp.nov.

Figs. 1, 40

Type locality

Pagosa Springs, Colorado, United States.

Type material

Holotype female: UNITED STATES. Colorado: Pagosa Springs, 17 mi. W, 6600' [2000 m], 18.viii.[19]71, DF Hardwick (CNCI).

Etymology

The name refers to the fact that the only known specimen of this species was collected near Pagosa Springs, Colorado.

Diagnosis

The female genitalia of *N. pagosa* are similar to those of *N. inermis* but can be separated by examining the ovipositor lobes of *N. inermis*, which are shorter than those of *N. pagosa*. In addition, the sclerites that run between the ovipositor lobes on the ventral surface are much longer and narrower in *N. pagosa* than in *N. inermis*. Externally, *N. pagosa* resembles a small *Eremobina* McDunnough species but genital examination shows it to be closely allied to the *N. subjuncta* group.

Description

Males unknown. Forewing length 13 mm. Antennae filiform; scape, head, and palpi dark gray; prothoracic collar dark gray basally with thin black medial line, edged posteriorly with gray and white scales; thorax, tegulae, and dorsal tuft adjacent to abdomen hoary gray. Dorsal forewing ground color light gray; orbicular spot light gray with darker gray center, edged thinly with black; reniform spot light gray with darker gray center, edged thinly with black; basal dash black; antemedial line black, more or less straight except within cell 1A + 2A where it turns abruptly towards base of wing

at 90°; mesial band divided by a black line running longitudinally through center of cell CuA2; mesial band filled with dark gray below and a mixture of gray and rust colored scales above this line; postmedial line black, becomes obscure above M3 edged distally with whites scales; cubital veins thinly edged with black scales through subterminal area; obscure subterminal line light gray; terminal line black; fringe gray, darker between veins giving a checkered appearance. Dorsal hind wing light gray with faint, grey median, postmedial, and subterminal lines; dark brown terminal line crisp; fringe gray with off-white base. **Male genitalia.** Unknown. **Female genitalia** (Fig. 40). Ovipositor lobes bluntly pointed. Heavily sclerotized ductus bursae widens towards ostium. Bursa copulatrix widens medially and is pointed anteriorly with signa absent. Lightly wrinkled appendix bursae reduced to form a low bump on ventral bursa copulatrix.

Distribution and habitat

The holotype of *N. pagosa* was collected at mid-elevation near Pagosa Springs, Colorado.

Neoligia hardwicki, sp.nov.

Figs. 14, 44

Type locality

Beaver, Utah, United States.

Type material

Holotype female: UNITED STATES. Utah: Beaver, 5 mi. E, 6300' [1920 m], 28.viii.1965, DF Hardwick (CNCI).

Etymology

This species is named after David Hardwick, who collected the holotype.

Diagnosis

The female genitalia of *N. hardwicki* show the species to be of the *M. subjuncta* group, but the semicircular pocket on the left ductus bursae is diagnostic. Externally, *N. hardwicki* appears charcoal gray in color rather than the browns and light grays of the other species of the *subjuncta* group (*N. subjuncta*, *N. inermis*, *N. pagosa*. *N. canadensis*, *N. atlantica*, *N. semicana*, and *N. surdirena*).

Description

Males unknown. Forewing length 12 mm. Antennae filiform; scape, head, and palpi gray brown; prothoracic collar light gray with thin black medial line; thorax and tegulae hoary gray brown. Dorsal forewing ground color light gray brown; orbicular spot light gray brown, edged thinly with dark brown; reniform spot light gray brown, edged thinly with black basally, off-white elsewhere; claviform spot filled with gray brown, edged thinly with black; antemedial line white, thinly edged (basally and distally) with black scales, more or less evenly excurved; mesial band divided by a black bar running longitudinally through fold; mesial band filled with gray brown below black bar and above orbicular and reniform spots but rust between spots and bar; postmedial line white, obscure above M3 and edged basally and distally with black scales; cubital veins thinly edged with black scales through subterminal area; obscure

subterminal line light gray; terminal line black; fringe dark gray brown, buff brown between veins giving a checkered appearance. Dorsal hind wing light gray brown; dark brown terminal line; fringe gray with off-white base. **Male genitalia.** Unknown. **Female genitalia** (Fig. 44). Ovipositor lobes bluntly pointed. Ductus bursae lightly sclerotized with fine longitudinal ridges and a semicircular sclerotized pocket mid-way along left side. Bursa copulatrix sack-like with signa absent. Sclerotized, wrinkled appendix bursae reduced to form a low bump on ventral bursa copulatrix.

Distribution and habitat

The holotype of N. hardwicki was collected at mid elevation near Beaver, Utah. The exact habitat is unknown.

Neoligia surdirena, sp.nov.

Figs. 11, 28, 38

Type locality

Sandia Mts., New Mexico, United States.

Type material

Holotype male: UNITED STATES. New Mexico: Sandia Mts., Cedar Crest, Bernalillo Co., 22.vii.[19]76, J Smeltzer (CNCI). Paratype (19): UNITED STATES. Arizona: Flagstaff, Coconino Co., 21.vii.1949, JW Gertsch (AMNH).

Etymology

The name is derived from Latin and refers to the indistinct reniform spot.

Diagnosis

Neoligia surdirena is separated from the other species in the group by the greatly enlarged cucullus of the male, large bursa of the female, and by the obscure, gray reniform spot.

Description

Males and females similar. Forewing length 11–12 mm. Antennae filiform, ciliate; scape, head, and palpi dark gray; prothoracic collar hoary dark gray with thin black median line; thorax, tegulae, and dorsal tuft adjacent to abdomen hoary gray brown. Dorsal forewing ground color gray brown, orbicular spot orangish beige, edged thinly with rust colored scales; reniform spot gray with scattered orangish beige scales without distinct margins; claviform spot rust colored without distinct margins; antemedial line black, edged proximally with white scales, slightly concave; mesial band divided by an indistinct black and orange line running through center of cell CuA2; mesial band filled with tawny beige scales between claviform and reniform spots, a mixture of rust, brown, and gray scales elsewhere; thin black postmedial line edged distally with white and pale orange scales, becomes obscure above M3; subterminal area a mixture of white, gray, gray-brown, and brown scales; veins thinly edged with black and white scales through subterminal area with gray and white scales proximal to postmedial line; subterminal line light beige; terminal area a mixture of gray and light-orange scales; terminal line a series of black triangles between veins; fringe dark gray. Dorsal hind wing and fringe uniformly gray brown. Male genitalia (Fig. 28). Cucullus greatly enlarged with weak corona and sclerotized ridge running from middle of valve to form an elongate spine on lower margin. Clavus short, broad, and rounded. Uncus thin without terminal spine. Vinculum with lateral flaps greatly reduced. Saccus rounded. Aedoeagus with terminal spine on ventral surface. Vesica sack-like, loops upward and then downward with ventral sclerite to provide rigidity; small subbasal diverticulum with bulbous cornutus and smaller subapical diverticulae occur on left. A patch of subapical cornuti occurs on dorsal surface. **Female genitalia** (Fig. 38). Ovipositor lobes bluntly pointed. Ductus bursae lightly sclerotized. Ostial plate straight on posterior margin, rounded anteriorly. Bursa copulatrix quite large, globular with signa absent. Lightly sclerotized appendix bursae reduced to form a low bump on ventral bursa copulatrix.

Distribution and habitat

Neoligia surdirena is known from two specimens, one from Flagstaff, Arizona, the other from the Sandia Mts., New Mexico.

Neoligia tonsa (Grote), comb.nov.

Figs. 6a-6f, 26, 35

Hadena tonsa Grote 1880: 214; Smith 1893: 143; Dyar, 1902: 114. Holotype female BMNH, London [photographs examined].

Oligia tonsa (Grote); Hampson 1908: 392; McDunnough 1938: 88; Franclemont and Todd 1983: 138; Poole 1989: 724.

Hadenella laevigata Smith 1898: 321; Dyar 1902:108. Lectotype male USNM, Washington, District of Columbia [examined].

Oligia laevigata (Smith); Hampson 1908: 392; Franclemont and Todd 1983: 138; Poole 1989: 723.

Oligia tonsa laevigata (Smith); McDunnough 1938: 88.

Type locality

Nevada, United States (tonsa); Colorado, United States (laevigata).

Diagnosis

Neoligia tonsa is the only species in the group with asymmetrical valves combined with short ventral spines on the valve (Fig. 26) and with the lower corner of the reniform spot usually distinctly splayed towards the outer margin (Figs. 6a-6f).

Range

Neoligia tonsa occurs from southern British Columbia and southwestern Alberta southward to southern Colorado, northern Arizona, and southern California. It occurs in xeric Ponderosa Pine forests and sagebrush steppe.

Neoligia rubirena, sp.nov.

Figs. 3, 36

Type locality

Chiricahua Mts., Arizona, United States.

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Type material

Holotype female: UNITED STATES. Arizona: Cochise Co., Chiricahua Mountains, Barfoot Park, 8040 ft [2450 m], 15.viii.2001, 31.9155N, 109.2821W, UV light and traps, Peter M Jump (CNCI). Paratypes $(2\mathfrak{P})$: UNITED STATES. Arizona: White Mts., Apache Co., near McNary PO., 15–30.viii.1925, CC Poling $(1\mathfrak{P}, USNM)$; Cochise Co., Pinery Canyon Camp, Chiricahua's, 6900' [2100 m], 4.ix.1992, Ron Leuschner (1 \mathfrak{P} , JTT).

Etymology

The name is from Latin and refers to the reddish coloration of the reniform spot.

Diagnosis

Neoligia rubirena is similar to *N. subjuncta* and *N. inermis*, but it can be separated from them by the reddish color of the reniform spot. In addition, the deeply notched ostium bursae is a uniquely derived character in the genus.

Description

Males unknown. Forewing length 12.5 mm. Antennae filiform, ciliate; scape, head, and palpi brown; prothoracic collar brown basally edged with black line; thorax, tegulae, and dorsal tuft adjacent to abdomen brown. Dorsal forewing ground color light gray brown, orbicular spot light orange brown, edged thinly with black and with brown scales in center; reniform spot orange red edged thinly with dark brown with small patches of gray scales near top and bottom; claviform spot triangular, filled with rust colored scales and edged thinly with black; antemedial line double, black distally, brown basally, with light buff brown in center, more or less evenly convex; mesial band divided by a black line running longitudinally through center of cell CuA2, mesial band filled with dark brown and rust scales between claviform and reniform spots, dark brown elsewhere; postmedial line double, evenly convex, black basally, a thin brown line distally with buff in center, becomes obscure above M3; cubital veins thinly edged with black scales through subterminal area; obscure subterminal line light buff; terminal line a series of black triangles between veins; fringe dark brown. Dorsal hind wing light buff with obscure discal spot becoming gradually darker through postmedial area to form a light buff submarginal band; terminal line dark brown; dark brown spot at end of vein CuA2; fringe dark brown distally with light buff at base. Male genitalia. Unknown. Female genitalia (Fig. 36). Ovipositor lobes bluntly pointed. Ductus bursae not heavily sclerotized. Posterior corpus bursae heavily sclerotized, broadly attached to heavily sclerotized appendix bursae on left. Bursa copulatrix widens medially and is pointed anteriorly with signa absent. Ostium bursae deeply notched on ventral surface.

Distribution and habitat

Neoligia rubirena is known from three female specimens that were collected in the White and Chiricahua mountains of Arizona.

Neoligia invenusta, sp.nov.

Figs. 4a-4f, 24, 37

Type locality

Mt. Kobau, British Columbia, Canada.

Type material

Holotype male: CANADA. British Columbia: Mt. Kobau, 49°06'N, 119°39'W, 6040' [1840 m], 4.viii.1999, J Troubridge (CNCI). Paratypes (455, 1319): CANADA. British Columbia: same data as holotype $(1\sigma, 16^{\circ}, CNCI, JTT)$; same locality and collector, 20.viii.1999 (3°, 28°, CNCI, JTT); same locality and collector, 17.vii.1998 (2º, CNCI, JTT); same locality and collector, 1.viii.1997 (6♂, 23º, CNCI, JTT); Castlegar (Brilliant), 16.vi.1995, J Troubridge (1or, CNCI); Quilchena, Nicola Lk., 50°05'N, 120°25'W, 1.viii.1999, J Troubridge (1°, 1°, CNCI); Agassiz, 10.viii.1999, J Troubridge (1♂, CNCI); Agassiz, 18.viii.1997, J Troubridge (1♀, CNCI); Kirby Flats Rd., S of Lillooet, 50°32'N, 121°43'W, 6.vii.1999, J Troubridge (1or, CNCI); same locality and collector, 10.vii.1999 (1°, CNCI); same locality and collector, 29.viii.1997 $(1^{\circ}, \text{CNCI})$; same locality and collector, 26.vii.1999 (4°, 1°, CNCI, JTT); same locality and collector, 26.viii.1999 (4°, 9°, CNCI); Keremeos, 11 mi. N, 2600' [800 m], 3.viii.1960, DF Hardwick (1º, CNCI); UNITED STATES. Washington: Table Rock, Columbia Co., 46°01'N, 117°54'W, 6200' [1900 m], 14.viii.1998, J Troubridge (4°, 139, CNCI, JTT); Bridgeport, 48°00'N, 119°37'W, 1000' [300 m], 19.vi.1998, J Troubridge (1[°], CNCI); Yakima Co., Bethel Ridge, 6000' [1850 m], 18.viii.1997, J Troubridge (1°, CNCI); same locality and collector, 28.viii.1998 (1°, CNCI); same locality and collector, 27.viii.1998 (1º, CNCI); same locality and collector, 25.vii.1996 (1º, CNCI); Chelan Co., Junior Pt. Campground, 6900' [2100 m], 6.viii.1997, J Troubridge (2º, CNCI); same locality and collector, 18.vii.1998 (1ot, 3º, CNCI, JTT); same locality, 4.viii.1989, L Crabo (1or, LGC); Bear Cyn., Yakima Co., 46°42'N, 120°53'W, 2400' [700 m], 15.viii.1998, J Troubridge (1º, LGC); Kittitas Co., Reecer Creek at Johnson Cyn., 47.16°N, 120.61°W, 20.vii.1991, L Crabo (5°, 2°, LGC); Chelan Co., 0.5 mi. E of Chumstick Mt. summit, 47.64°N, 120.44°W, 5.viii.1989, L Crabo & C Coughlin (3°, 1°, LGC); Whatcom Co., Chuckanut Bay, 48.69°N, 122.49°W, 17.viii.1993, L Crabo (1º, LGC); Whatcom Co., W slope of Chuckanut Mt., 48.68°N, 122.48°W, 21.viii.1995, L Crabo (19, LGC); Island Co., Lowell Pt., Camano Island, 48.12°N, 122.48°W, 25 m, 9.ix.1989, L Crabo (19, LGC); Douglas Co., Badger Mt., 3 mi ESE Orondo, 47.60°N, 120.17°W, 8.vii.1992, L Crabo (2º, LGC); Oregon: Mt. Ashland, Jackson Co., 42°04'N, 122°42'W, 6400' [2000 m], 2.viii.1998, J Troubridge (1°, CNCI); Drake Peak, Lake Co., 7700' [2300 m], 42°18'N, 120°09'W, 1.viii.1998, J Troubridge (1^{ot}, CNCI); Illinois R., Josephine Co., 42°45'N, 123°41'W, 3.viii.1998, J Troubridge (1º, CNCI); Williams, Josephine Co., 42°12'N, 123°14'W, 3.viii.1998, J Troubridge (3º, CNCI, JTT); Jackson Co., 2 mi. N of Vanora, 25.viii.1997, J Troubridge (1º, CNCI); Lane Co., NFD 1506, Frissell Pt., 23.viii.1997, J Troubridge (1♀, CNCI); same locality and collector, 26.vii.1996 (1♂, CNCI); Harney Co., N Shore of Fish Lake, Steens Mt., 42.73°N, 118.64°W, 27.vii.1991, L Crabo (19, LGC); Lane Co., HJ Andrews Exp. Forest, Ridge between Blue and Lookout Creeks, 44.22°N, 122.24°W, 2.ix.1990, L Crabo (19, LGC); California: Happy Valley, Plumas Co., 32°52'N, 120°37'W 5600' [1700 m], 28.viii.2000, J Troubridge (8º, CNCI, JTT); San Diego Co., Laguna Mts., Kitchen Creek Rd., 25.viii.1995, T Mustelin (1º, CNCI); Nevada: White Pine Co., Osceola Ditch, Great Basin N.P., 13.viii.1988, S McKown (23, CNCI).

Etymology

The name is Latin and means "unattractive."

Diagnosis

Neoligia invenusta can be similar to *N. tonsa* in range of individual variation. It ranges from a dark, mottled gray brown over the entire forewing to black basal and white distal to the postmedial line. It is separated from the other species by the genitalia. Males have symmetrical valves, rounded cucullus, and long spine on the vesica, whereas females have a deeply furrowed, rugose ductus bursae not seen in the other species of the group.

Description

Males and females similar, individual variation extreme. Forewing length 11– 12 mm. Antennae filiform, ciliate; scape, head, and palpi dark gray brown; prothoracic collar dark gray brown with black median line; thorax, tegulae, and dorsal tuft adjacent to abdomen dark gray brown. Dorsal forewing ground color gray brown, orbicular spot gray brown, edged thinly with black; reniform spot gray brown in proximal one third, gray in distal one third with white in center, edged thinly with white towards costa, black elsewhere; claviform spot more or less triangular, filled with gray brown scales and edged thinly with black; antemedial line double, black distally, brown basally, with light gray brown in center, slightly concave; mesial band filled with a mixture of dark gray brown and rust scales; black median line obscure; thin black postmedial line becomes obscure above M3; subterminal area a mixture of white, gray, gray-brown, and brown scales, becomes darker distally; veins above M3 thinly edged with black scales through subterminal area; obscure subterminal line dark gray brown; terminal area dark gray brown; terminal line a series of black triangles between veins; fringe a series of short and long scales, both rows dark brown, shorter row tipped black. Dorsal hind wing light gray brown basally, gradually getting darker towards outer margin; cubital veins edged with darker scales with dark spot at end of vein CuA2; fringe a series of short and long scales, first row light brown tipped with dark brown, terminal row light brown. Male genitalia (Fig. 24). Cucullus elongate, upturned, bluntly rounded. Corona of long, fine hairs and sclerotized ridge running from middle of valve to form an elongate, upturned spine on lower margin. Ampulla of clasper short, slender, and weak. Clavus bends abruptly towards aedoeagus, bluntly pointed. Uncus thin without terminal spine. Vinculum with enlarged pointed (about 95°) lateral flaps. Saccus squared of with rounded corners. Aedoeagus unarmed. Vesica sack-like, bends to right with large ventral, subbasal diverticulum and smaller, ventral subapical diverticulum. Two major cornuti are present: first in form of a bulbous cornutus, which caps large subbasal diverticulum and terminating in a large spine (about half length of aedoeagus) that bends back to aedoeagus on ventral side; second in form of a long sclerite running from tip of vesica, terminating subbasally on dorsal surface with a sclerotized mound with numerous small spines. Female genitalia (Fig. 37). Ovipositor lobes rounded at apex. Ostial plate straight on posterior margin, rounded anteriorly. Anterior half of ductus bursae with heavily sclerotized ridges. Posterior corpus bursae heavily sclerotized, widely joined to sclerotized appendix bursae. Bursa copulatrix more or less oval, narrows towards appendix bursae with weak elongate ventral signum and weak elongate dorsal signum.

Distribution and habitat

Neoligia invenusta has been collected in various habitats from subalpine meadows to sagebrush steppe and chaparral to wet coastal forests. It occurs from the Pacific Coast of California and British Columbia, east throughout the Great Basin. This is one of the more common species in the genus.

Neoligia elephas, sp.nov. Figs. 17, 23

Type locality

Apache National Forest, Greenlee Co., Arizona, United States.

Type material

Holotype male: UNITED STATES. Arizona: Greenlee Co., Apache N.F. rd 54 trlhd, 9400' [2856 m], N Hannegan Mdws, MV & UV traps, 29.vii.1996, P Opler & E Buckner (CNCI). Paratypes (23): UNITED STATES. Arizona: 1 mi. S of Jacob Lk., Coconino Co., 24.vii.1965, 8200' [2500 m], FP & M Rindge (23, AMNH).

Etymology

The name *elephas* means "elephant" in both Latin and Greek. The male cucullus resembles an elephant's head.

Diagnosis

Externally, *N. elephas* closely resembles *N. lillooet*; however, the male genitalia most closely approach those of *N. invenusta*. The valvae of *N. invenusta* are symmetrical, but those of *N. elephas* are asymmetrical, with the massive ventral spines of *N. elephas* projecting in different directions to allow the valves to close. Other differences include the much longer ventral spines at the base of the cucullus, the smaller subapical diverticulum, and the much shorter medial cornutus on the vesica of *N. elephas*.

Description

Forewing length 10 mm. Antennae filiform, ciliate: scape, head, and palpi with dark gray brown scales tipped with white; prothoracic collar dark gray brown with black median line; thorax, tegulae, and dorsal tuft adjacent to abdomen dark gray brown. Dorsal forewing ground color gray brown, orbicular spot light gray brown, edged thinly with black; reniform spot gray brown in proximal one third, whitish in distal two thirds, edged thinly with white, a single row of orange and then a single row or black scales occurs along basal margin; claviform spot more or less oval, filled with brown scales and edged thinly with black; antemedial line double, black distally, brown basally, with light gray brown in center, slightly concave; mesial rust brown distal to claviform spot, dark brown elsewhere; black median line obscure; thin, black postmedial line becomes obscure above M3, broadly edged with white distally below reniform spot; subterminal area a mixture of white, gray, gray-brown, and brown scales, darker distally; veins above M3 thinly edged with black scales through subterminal area; subterminal line light gray brown; terminal area dark gray brown; terminal line a series of black triangles between veins; fringe a series of short and long scales, both rows dark brown, shorter row tipped black. Dorsal hind wing light gray brown basally, gradually getting darker towards outer margin; cubital veins edged with darker scales, with dark spot at end of vein CuA2; fringe a series of short and long scales, first row whitish, tipped with dark brown, distal row off-white. Male genitalia (Fig. 23). Cucullus elongate, dorsoventrally constricted in midsection, bluntly rounded with corona of long fine hairs and sclerotized ridge running from middle of valve to form an elongate curved spine on lower margin. Left spine projects ventrally before curving posteriorly but right spine projected anteroventrally before curving ventrally, making THE CANADIAN ENTOMOLOGIST

right cucullus appear longer than left one. Ampulla of clasper short, slender, and weak. Clavus short, bluntly pointed, bends towards aedoeagus. Uncus thin without terminal spine. Vinculum with enlarged pointed (about 95°) lateral flaps. Saccus squared-off with rounded corners. Aedoeagus unarmed. Vesica sack-like, bends ventrally and to right with large ventral subbasal diverticulum and smaller ventral subapical diverticulum. Two major cornuti are present: first in form of a long sclerite running from tip of vesica along dorsal surface of vesica to a point midway along vesica (giving support to vesica) and terminating in a short spine; second in form of a bulbous cornutus that caps large subbasal diverticulum and tipped with a long dorsally projected spine. A small patch of weak subapical cornuti is present on ventral surface. **Female genitalia.** Unknown.

Distribution and habitat

Neoligia elephas has been collected at high elevation in Arizona. The exact habitat is unknown.

Neoligia albirena, sp.nov.

Figs. 5a-5d, 25, 42

Oligia tonsa ab. *fasciata* Barnes and McDunnough 1912: 10, plate 3, Fig. 18. An unavailable infrasubspecific name. Holotype male, Eureka, Utah, United States. USNM, Washington, District of Columbia [examined].

Type locality

Mt. Kobau, British Columbia, Canada.

Type material

Holotype male: CANADA. British Columbia: Mt. Kobau, 49°05'N, 119°37'W, 4000–6000' [1200–1800 m], 1.viii.1997, J Troubridge (CNCI). Paratypes (473, 50?): **CANADA. British Columbia:** same data as holotype (95, 139, CNCI, JTT); same locality and collector, 20.viii.1999 (13, 129, CNCI, JTT); same locality and collector, 13.viii.1998 (1°, 1°, CNCI); same locality and collector, 17.vii.1998 (3°, CNCI); same locality and collector, 4.viii.1999 (6°, 1°, CNCI, JTT); White Lk., NW of Oliver, 30.vii.1996, J Troubridge (1or, CNCI); Kirby Flats Rd., S of Lillooet, 50°32'N, 121°43'W, 26.viii.1999, J Troubridge (3°, CNCI, JTT); same locality and collector, 29.viii.1997 (1°, 1°, CNCI); same locality and collector, 6.vii.1999 (2°, CNCI); same locality and collector, 18.vii.2000 (1°, CNCI); 5 km SE of OK Falls, 19-25.viii.1990, J Troubridge (1º, CNCI); McGillivray Crk., 50°31'N, 121°40'W, 11.viii.2000, J Troubridge (1°, 2º, CNCI, JTT). UNITED STATES. Washington: Walla Walla, 28.v.1958, WC Cook (1º, CNCI); same locality and collector, 30.v.1958 (1º, CNCI); Davis Cyn., Okanagan Co., 14.viii.1993, J Troubridge & L Crabo (6o, 92, CNCI, JTT, LGC); Yakima Co., Bethel Ridge, 6000' [1850 m], 25.vii.1996, J Troubridge (1°, CNCI); Chelan Co., Junior Pt. Campground, 6900' [2100 m], 18.vii.1998, J Troubridge (1º,); Grant Co., 1.5 mi. N of Wanapum Dam, 3.vii.1990, L. Crabo (1°, LGC). Oregon: 5 mi. S of Suplee, Crook Co., 44°01'N, 119°39'W, 4.ix.1999, J Troubridge (1°, CNCI); Weberg Rd., 1 mi. S of Weberg, Grant Co., 5.ix.1997, J Troubridge (19, CNCI); Utah: Stockton, 30.vii.1913, T Spalding (23, CNCI); same locality and collector, 1.viii.1913 (1°, CNCI); same locality and collector, 29.viii.1913 (1°, CNCI); Eureka, 13.viii.1911, T Spalding (1*s*, CNCI); same locality and collector, 14.viii.1911 (1º, CNCI); Provo, 21.vii.1912, T Spalding (1or, CNCI). Colorado: Jefferson Co., Lookout Mt., 12.ix.1993, Don Bowman (2 d, CSUC); Glenwood Springs, Barnes

Collection (1°, USNM). California: Smoky Valley, Tulare Co., 29.vi.1951, G & J Sperry (1°, AMNH). Wyoming: 1 mi. E of Laramie, 7468' [2300 m], Albany Co., 24.viii.1987, JS Nordin (1°, CNCI); same locality and collector, 22.vii.1998 (1°, CSUC). Nevada: Sixmile Creek, Storey Co., 39°18'N, 119°37'W, 1700 m, 29.viii.2000, J Troubridge (2°, CNCI, JTT).

Etymology

The name is derived from Latin and refers to the white scales in the reniform spot that aid in diagnosing this species.

Diagnosis

The forewing of *N. albirena* ranges from black to a dark, mottled gray brown over the entire forewing in Colorado and the Pacific Northwest to white or white with a distinct black mesial band in Utah. It is separated from the other species by the genitalia. Males have symmetrical valves, squared-off cucullus, and long spine at the base of the cucullus. Even the blackest specimens normally have the white scales present in the center of the reniform spot. Female genitalia are closest to those of *N. tonsa*. The appendix bursae of *N. tonsa* is normally slightly larger than that of *N. albirena*.

Description

Males and females similar, individual variation extreme. Forewing length 10-11 mm. Antennae filiform, ciliate; scape, head, and palpi dark gray; prothoracic collar dark gray with black median line; thorax, tegulae, and dorsal tuft adjacent to abdomen dark gray. Dorsal forewing ground color dark gray, orbicular spot dark gray, edged thinly with black; reniform spot gray in proximal half, white in distal half, edged thinly with black on basal edge; claviform spot rounded distally, filled with dark gray and dark rust scales and edged thinly with black; antemedial line black, slightly concave; mesial band divided by a black line running longitudinally through center of cell CuA2; mesial band filled with dark rust brown scales between claviform and reniform spots, dark gray brown elsewhere; thin black postmedial line edged distally with white scales, becomes obscure above M3; subterminal area a mixture of white, gray, gray-brown, and brown scales, becomes darker distally; veins above M3 thinly edged with black scales through subterminal area; obscure subterminal line light brown; terminal area dark gray brown; terminal line black; fringe a series of short and long scales, both rows dark gray brown, tipped with black. Dorsal hind wing light gray brown basally, gradually getting darker towards outer margin; veins edged with darker scales, with dark spot at end of vein CuA2: fringe a series of short and long scales, first row beige tipped with dark brown, distal row off-white. Male genitalia (Fig. 25). Cucullus more or less square with weak corona and sclerotized ridge running from middle of valve to form an elongate, upturned spine on lower margin. Ampulla of clasper short, slender, and weak. Clavus short bluntly pointed. Uncus thin without terminal spine. Vinculum with enlarged pointed (about 95°) lateral flaps. Saccus rounded. Aedoeagus unarmed. Vesica sacklike, bends to right with ventral subbasal diverticulum and smaller ventral subapical diverticulum. Two major cornuti present: first in form of a long sclerite running perpendicular to aedoeagus on dorsal side of vesica; second in form of a short subbasal plate on ventral surface with a spine directed towards aedoeagus. Lightly sclerotized ridges occur on inner surface and a subapical patch of short cornuti occurs on outer surface. Female genitalia (Fig. 42). Ovipositor lobes rounded at apex. Ostial plate straight on posterior margin, rounded anteriorly. Ductus bursae sclerotized. Posterior corpus bursae sclerotized, widely joined to relatively small, sclerotized appendix bursae. Bursa copulatrix more or less oval, narrows towards appendix bursae with signa absent.

Distribution and habitat

Neoligia albirena has been collected in xeric habitats (usually Ponderosa Pine forests and sagebrush steppe) from western Wyoming and Colorado, through Utah, to the east side of the Cascades in British Columbia, Washington, and Oregon, south to Tulare Co., California. It is not particularly common.

Neoligia lancea, sp.nov.

Figs. 12a–12b, 27, 47

Type locality

Drake Peak, Lake Co., Oregon, United States.

Type material

Holotype male: UNITED STATES. Oregon: Drake Peak, Lake Co., 7700' [2300 m], $42^{\circ}18'$ N, $120^{\circ}09'$ W, 1.viii.1998, J Troubridge (CNCI). **Paratypes** (13° , 15°): CANADA. British Columbia: Mt. Kobau, 1.viii.1997, J Troubridge (13, CNCI). UNITED STATES. Washington: Wallula, 20.viii.1948, WC Cook (1or, CNCI); same locality and collector, 30.vi.1949 (1°, CNCI); Table Rock, Columbia Co., 46°01'N, 117°54'W, 6200' [1900 m], 14.viii.1998, J Troubridge (3°, CNCI, JTT); Yakima Co., Bethel Ridge, 6000' [1850 m], 18.vii.1997, J Troubridge (1♂, 7♀, CNCI, JTT); same locality and collector, 27.viii.1998 (1º, CNCI); Chelan Co., Junior Pt. Campground, 6100' [2000 m], 18.vii.1998, J Troubridge (1o, 29, CNCI, JTT); same locality and collector, 15.viii.1998 (1&, CNCI); Okanagan Co., 1 mi. NE Wakefield, 4.ix.1997, J Troubridge (1°, CNCI); Kittitas Co., Quartz Mtn., 47.07°N, 121.07°W, 14.vii.1990, L Crabo (1°, LGC); Douglas Co., Badger Mt., 3 mi. ESE Orondo, 47.60°N, 120.17°W, 8.vii.1992, L Crabo (1^{or}, LGC). Oregon: Alkali Lk., Lake Co., 4700' [1400 m], 43°00'N, 120°00'W, 14.ix.1998, J Troubridge (1², CNCI); Brownlee, Baker Co., 44°50'N, 116°53'W, 12.vi.1999, J Troubridge (1º, CNCI); Mt. Ashland, Jackson Co., 42°04'N, 122°42'W, 6400' [2000 m], 2.viii.1998, J Troubridge (1°, CNCI); Jackson Co., 2 mi. N of Vanora, 25.viii.1997, J Troubridge (3º, CNCI, JTT).

Etymology

The name is derived from Latin and refers to the lance-like spine on the ventral side of the male valve.

Diagnosis

Neoligia lancea is separated from the other species by the genitalia. It is separated from *N. lillooet* by the longer spine at the base of the cucullus of *N. lancea*. The transverse black line below the claviform spot is normally distinctive and the mesial band is often filled with purplish-brown scales. A patch of beige scales adjacent and distal to the claviform spot may be present. In the female, the appendix bursae is evenly bisected by a ventral trough, unevenly bisected in *N. lillooet* (the right half much smaller than the left). The appendix bursae is not bisected in the other species of the group.

Description

Males and females similar. Forewing length 10–11 mm. Antennae filiform, ciliate; scape, head, and palpi dark gray; prothoracic collar dark gray with black median line; thorax, tegulae, and dorsal tuft adjacent to abdomen dark gray. Dorsal forewing ground color gray, orbicular spot purplish brown, edged thinly with black; reniform spot gray in proximal half, white in distal half, edged thinly with black on basal edge; claviform spot rounded distally, filled with purplish brown scales and edged thinly with black; antemedial line black, edged proximally with white scales, more or less straight except within 1A + 2A where it turns abruptly towards thorax; mesial band divided by a crisp black line running longitudinally through center of cell CuA2; mesial band filled with tawny beige scales between claviform and reniform spots, dark purplish brown elsewhere; thin black postmedial line edged distally with white scales, becomes obscure above M3; subterminal area a mixture of white, gray, gray-brown, and brown scales; veins thinly edged with black and white scales through subterminal area with gray and white scales basal to postmedial line; subterminal line light beige; terminal area dark gray brown; terminal line a series of black triangles between veins; fringe dark gray. Dorsal hind wing light gray brown basally, gradually getting darker towards outer margin; fringe a series of short and long scales, first row dark gray with beige base, distal row beige. Male genitalia (Fig. 27). Cucullus more or less rectangular with lower corner sclerotized to form a weak point; weak corona and sclerotized ridge running from middle of valve to form an elongate, down-turned spine on lower margin. Ampulla of clasper short, slender, and weak. Clavus short, rounded. Uncus thin without terminal spine. Vinculum with enlarged pointed (about 95°) lateral flaps. Saccus rounded. Aedoeagus unarmed. Vesica sack-like, bends to right with ventral subbasal diverticulum and smaller ventral subapical diverticulum. Two major cornuti are present: first in form of a long sclerite running perpendicular to aedoeagus on dorsal side of vesica; second in form of a short subbasal plate on ventral surface with a spine directed towards aedoeagus. Minute subapical spinules occur on inner surface and a subapical patch of short cornuti occurs on outer and ventral surface. Female genitalia (Fig. 47). Ovipositor lobes rounded at apex. Ostial plate straight on posterior margin, rounded anteriorly. Ductus bursae lightly sclerotized. Posterior corpus bursae lightly sclerotized, widely joined to lightly sclerotized appendix bursae. Appendix bursae bisected by unsclerotized channel on ventral surface. Bursa copulatrix more or less oval, narrows towards appendix bursae with signa absent.

Distribution and habitat

Neoligia lancea has been collected in xeric habitats (usually Ponderosa Pine forests and sagebrush steppe) in the northern Great Basin from Oregon to British Columbia east of the Cascades. It is not common.

Neoligia lillooet, sp.nov.

Figs. 13*a*-13*b*, 29, 48

Type locality

Lillooet, British Columbia, Canada.

Type material

Holotype male: CANADA. British Columbia: Kirby Flats Rd., S of Lillooet, 50°32'N, 121°43'W, 26.viii.1999, J Troubridge (CNCI). Paratypes (2\$\sigma\$, 12\$\varepsilon\$):

CANADA. British Columbia: same data as holotype (4°, CNCI, JTT); same locality and collector, 10.vii.1999 (1°, CNCI); same locality and collector, 29.viii.1997 (1°, CNCI); same locality and collector, 26.viii.1999 (8°, CNCI, JTT).

Etymology

The species is named after Lillooet, British Columbia.

Diagnosis

Neoligia lillooet is most easily separated from the other species by the male genitalia. It is separated from *N. lancea* by the rounder cucullus of *N. lillooet* (squared-off in *N. lancea*) and the long spine at the base of the cucullus in *N. lancea*, which is reduced in *N. lillooet*. The light silvery gray hind wing of males usually helps separate *N. lillooet* from the other species in the group.

Description

Males and females similar, but male hind wing often lighter than that of female. Forewing length 10-11 mm. Antennae filiform, ciliate; scape, head, and palpi dark gray; prothoracic collar light, hoary gray with black median line; thorax, tegulae, and dorsal tuft adjacent to abdomen hoary gray. Dorsal forewing ground color light gray, orbicular spot gray in center, ringed with white scales, edged thinly with black except towards costa; reniform spot white in center, ringed with gray, edged thinly with orange and black on basal edge; claviform spot more or less triangular, filled with purplish gray scales and edged thinly with black; antemedial line double, black distally, dark gray basally, filled with light gray scales, more or less evenly concave; mesial band divided by a crisp black line running longitudinally through center of cell CuA2; mesial band filled with rust colored scales between claviform and reniform spots, dark purplish gray elsewhere; black median line distinct; thin black postmedial line edged distally with white scales, becomes obscure above M3; subterminal area a mixture of white and gray scales; veins thinly edged with black and white scales through subterminal area; subterminal line off white; terminal area dark gray brown; terminal line black; fringe dark gray. Dorsal hind wing light silvery gray basally, gradually getting darker towards outer margin; veins thinly edged with gray scales; fringe a series of short and long scales, first row dark gray with beige base, distal row white. Male genitalia (Fig. 29). Apex of cucullus more or less rounded with small, lightly sclerotized bump at apex of costa; corona absent; costa sclerotized almost to tip of valve, excurved through cucullus; sclerotized ridge running along ventral margin of valve to form a short spine which is pointed forward. Ampulla of clasper absent. Clavus short, rounded with lateral ridges. Uncus thin without terminal spine. Vinculum with enlarged pointed (about 90°) lateral flaps. Saccus rounded. Aedoeagus unarmed. Vesica sack-like, bends to right with ventral subbasal diverticulum and smaller ventral subapical diverticulum. Two major cornuti are present: first in form of a long sclerite running perpendicular to aedoeagus on dorsal side of vesica; second in form of a bulbous cornutus on ventral surface of subbasal diverticulum with spine directed towards aedoeagus; a subapical patch of short cornuti occurs on outer and ventral surface. Female genitalia (Fig. 48). Ovipositor lobes rounded at apex. Ostial plate straight on posterior margin, rounded anteriorly. Ductus bursae lightly sclerotized. Posterior corpus bursae leathery, lightly sclerotized, widely joined to lightly sclerotized appendix bursae. Appendix bursae bisected with left chamber much larger than right. Bursa copulatrix more or less oval, narrows towards appendix bursae with signa absent in some specimens, faint, located on left in others.

Distribution and habitat

Neoligia lillooet is known only from the type locality in the Fraser Canyon, British Columbia, where it occurs in open Ponderosa Pine forests.

Acknowledgements

We thank Martin Honey (The Natural History Museum, London), Mike Pogue (United States National Museum, Washington, District of Columbia), and Eric Quinter and Fred Rindge (American Museum of Natural History, New York) for their kind help. We also thank PT Dang for reviewing the manuscript and providing helpful comments.

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(Received: 2 August 2001; accepted: 24 January 2002)

Appendix A. Check list of Neoligia species.

Neoligia Troubridge and Lafontaine 2002 semicana (Walker 1865) latireptana (Walker 1865) hausta (Grote [1883]) canadensis Troubridge and Lafontaine 2002 semicana of authors, not Walker 1865 atlantica Troubridge and Lafontaine 2002 exausta (Smith 1903) crytora (Franclemont 1950) subjuncta (Smith 1898) inermis Troubridge and Lafontaine 2002 pagosa Troubridge and Lafontaine 2002 hardwicki Troubridge and Lafontaine 2002 surdirena Troubridge and Lafontaine 2002 tonsa (Grote 1880) laevigata (Smith 1898)

rubirena Troubridge and Lafontaine 2002 *invenusta* Troubridge and Lafontaine 2002 *elephas* Troubridge and Lafontaine 2002 *albirena* Troubridge and Lafontaine 2002 *lancea* Troubridge and Lafontaine 2002 *lillooet* Troubridge and Lafontaine 2002