

Three new species of *Lithophane* Hübner (Lepidoptera: Noctuidae: Xyleninae)

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Abstract

Three new species of *Lithophane* Hübner are described: *Lithophane lanei* and *L. scottae* from eastern Ontario, Canada, and *L. boogeri* from the high desert of Oregon, U.S.A. Adults and genitalia are illustrated.

Key words: *Lithophane*, Noctuidae, North America, genitalia, *Juniperus occidentalis*

Introduction

Lithophane is a Holarctic genus with 51 Nearctic species. Adults emerge in the autumn and hibernate over winter. Mating and oviposition occurs in late winter or early spring, and the larvae feed on woody plants. Adults are collected most commonly at bait, but they also come to lights. Due to the large number of species, a generic review of *Lithophane* is beyond the scope of this paper; however, in order that names be available for biodiversity inventories, I describe *L. lanei*, *L. scottae*, and *L. boogeri* below.

Forbes (1954) arranged the species of *Lithophane* into three groups. The first group includes *L. lanei* and is characterized by a differentiated cucullus with an apical corona and a well-developed digitus in the male genitalia; the larvae are associated with deciduous trees and shrubs. The second group includes *L. scottae* and is characterized by the loss of the cucullus and corona and by the distinct digitus, which is modified into a strong terminal spine on the valve; the larvae feed on deciduous trees and shrubs. The third group is characterized by the loss of the cucullus and corona and a vestigial digitus. Within this third group, *L. boogeri* is included in the *L. gausapata* Grote complex, where the uncus is sparsely setose and the digitus is reduced to a slight pollexlike process near the ventral apex of the valve; the larvae feed on Cupressaceae.

Both *L. lanei* and *L. scottae* were collected within the city limits of Ottawa, Ontario. Nothing is known of their early stages or life history. *Lithophane boogeri* has been collected in Idaho and eastern Oregon, where its larvae feed on *Juniperus occidentalis* Hooker.

Materials and methods

Specimens were examined from the following collections:

AMNH American Museum of Natural History, New York, United States.

CNC Canadian National Collection of Insects and Arachnids, Ottawa, Canada.

JTT Personal collection of James T. Troubridge, Ottawa, Ontario, Canada.

USNM National Museum of Natural History, Washington, United States.

Dissection of genitalia and terms for genital structures and wing markings follow Lafontaine (2004).

Systematics

Lithophane lanei new species

(Figs. 1, 4, 9)

Diagnosis. *Lithophane lanei* flies with and could be confused with *L. hemina* Grote. The genitalia are similar, but the two species can be distinguished by the distinct, blackish brown subreniform spot (similar to that of *L. patefacta* Walker) which is present in *L. lanei* but absent or paler and reduced in *L. hemina*, and the darker, charred appearance the forewing of *L. lanei*, paler and less hoary in *L. hemina*.

Description. (Fig. 1). Holotype: Forewing length 17 mm. Antenna filiform, ciliate; eye orbicular, lashed; head brown with black line between eyes; labial palpus brown with black line along outer edge; thoracic collar brown basally with black medial line, buff terminally; thoracic tuft gray brown basally with black medial line, edged with buff; tegula, thorax, and abdomen mottled brown; abdomen tufted. Dorsal forewing brown; basal dash blackish brown; antemedial and postmedial lines deeply saggitate, angled towards diffuse, darker brown median shade, these lines barely visible between veins but most obvious as tan dots on veins, bordered anteriorly and posteriorly with black dots; saggitate subterminal line tan, edged basally with chestnut brown, distally with blackish brown; reniform and oblong orbicular spots slightly paler than ground of wing; prominent blackish brown subreniform spot extends from antemedial line to postmedial line. Fringe brown. Dorsal hindwing light gray brown basally, darker in distal 1/3 and darker discal

lunule; fringe brown. **Male genitalia** (Fig. 4). Valve with small cucullus and corona present. Digitus with small spine near base of clasper and longer spine extending from tip of valve, below cucullus. Clasper arcs upward, then downward and inward. Uncus bearded, thickens slightly medially, pointed at tip. Vesica bulbous, bending upward and to the right with a small subapical diverticulum; a small patch of cornuti present at base of ductus seminalis. **Female genitalia** (Fig. 9). Ostium bursae with prominent knob-like process on ventral margin; ductus bursae with heavily sclerotized ventral plate, twisting around to dorsal surface at appendix bursae; ductus bursae bends to the right. Appendix bursae reduced to a bulge on posterior end of bursa. Bursa elongate with long signa on dorsal and ventral surfaces. Ovipositor lobes with fine setae.

Type material. Holotype male: Canada, Ontario, Stittsville [Ottawa], 45°12.03'N, 75°58.80'W, 6 April 2005, J. Troubridge (CNC). Paratypes: **Ontario**: 17 males, 8 females, same data as holotype; 1 male, Stittsville [Ottawa], 45° 12.03' N, 75° 58.80' W, 22 March, 2004, J. Troubridge; 2 males, Stittsville [Ottawa], 45° 12.03' N, 75° 58.80' W, 21 April, 2003, J. Troubridge; 4 males, 1 female, Carp Ridge, 45° 23.05' N, 76° 04.80' W, 18 April 2005, J. Troubridge; 2 males, Carp Ridge, 45° 23.05' N, 76° 04.80' W, 21 September 2004, J. Troubridge. Paratypes in the CNC and JTT.

Derivation of the name. I name this species for Harley Lane, who helped to collect the type series.

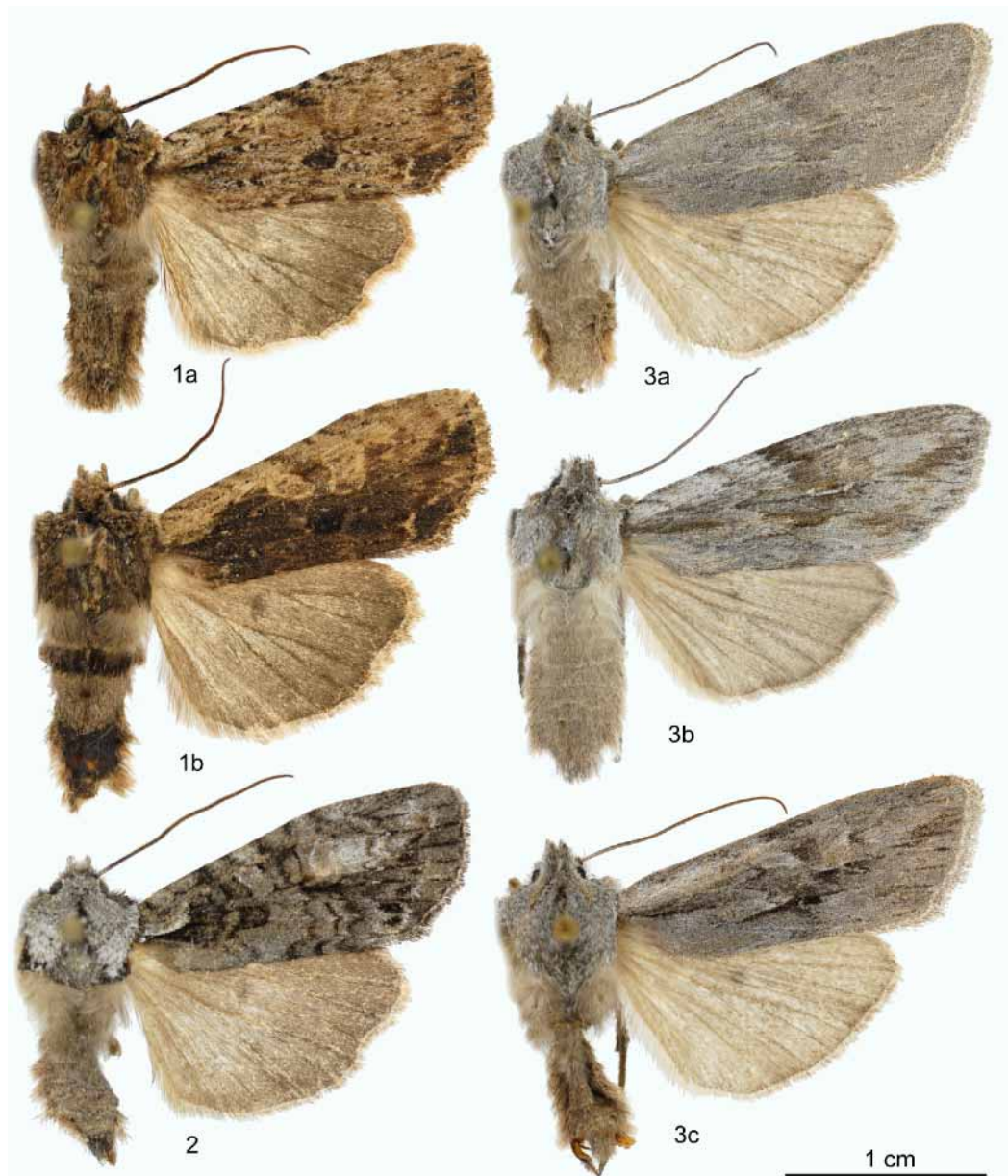
Distribution and habitat. *Lithophane lanei* was collected in mixed forest in rural granite and limestone areas within the city of Ottawa, Ontario. Nothing is known of its life history.

Lithophane scottae new species

(Figs. 2, 5)

Diagnosis. Externally, *L. scottae* most closely resembles *L. vivida* (Dyar) or *L. baileyi* Grote but is most easily separated from these species by the prominent patch of pale scales that extends from the distal margin of the reniform spot to or through the postmedial line toward the apex. The male genitalia are similar to those of *L. querquera* Grote, but the subbasal diverticulae on the vesica are smaller and the apical portion of the valve (distal to the pollex) as well as the digitus are longer and less stout than those of *L. querquera*.

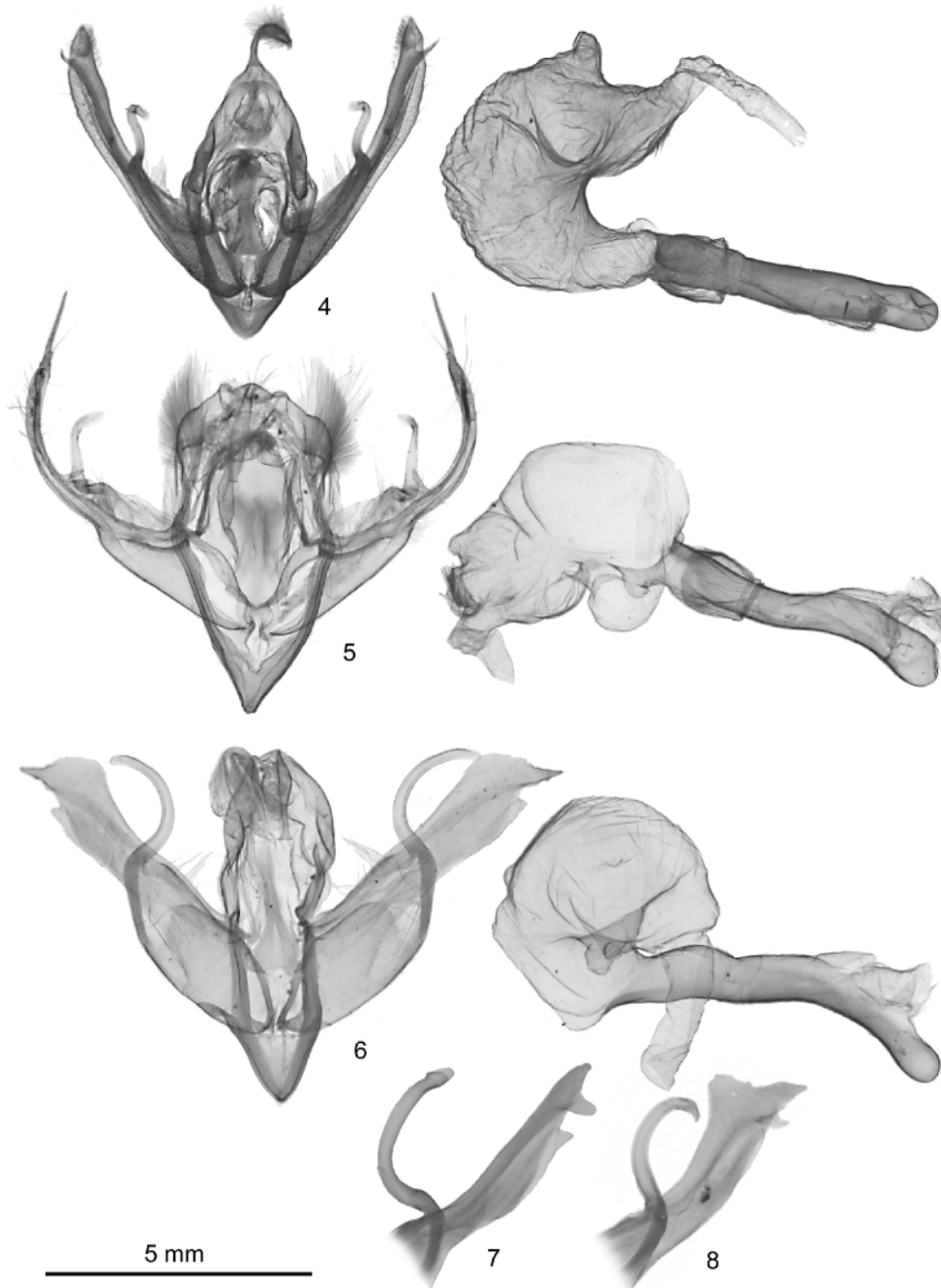
Description. (Fig. 2). Holotype: Forewing length 17 mm. Antenna filiform, ciliate; eye orbicular, lashed; head, palpus, prothoracic collar, and tufted thorax gray; tegula gray, bordered with black scales. Dorsal forewing medium gray; basal dash black, edged with white on anterior margin; antemedial line gray, thinly edged with black on anterior and posterior margins; medial line black; postmedial line gray, thinly edged with black on anterior and posterior margins; subterminal line light gray, edged basally with darker scales; oblong orbicular spot and reniform spot slightly paler than ground color of wing; a prominent but diffuse patch of pale scales extends from distal margin of reniform spot



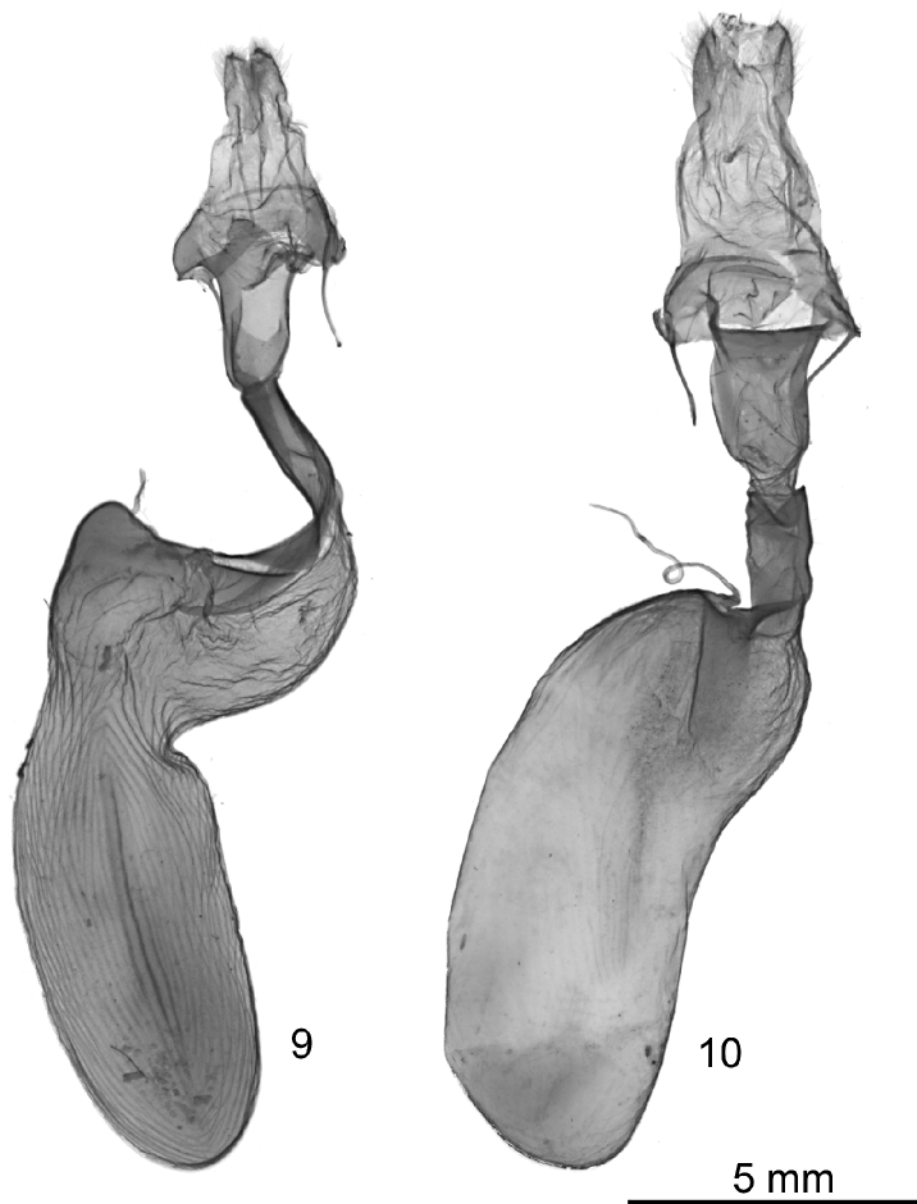
FIGURES 1–3. Adults of *Lithophane* species. **1a, b)** *L. lanei*, Ottawa, ON; **2)** *L. scottae*, Ottawa, ON; **3a, b, c)** *L. boogeri*, nr. Tumalo, OR.

through postmedial line toward apex of wing; claviform spot dark gray, edged with black scales. Fringe gray. Dorsal hindwing gray brown, slightly paler basal to obscure median line with slightly darker discal lunule; fringe pale gray. **Male genitalia** (Fig. 5). Costa of valve broadly sclerotized, extending beyond clasper, cucullus reduced to a small dorsal process above digitus. Digitus with finger-like process near base of clasper and very long needle-like spine extending from tip of valve. Clasper arcs widely away from dorsal

margin of valve. Uncus thickens slightly medially, squared off at apex. Vesica bulbous, bending upward and then posteriorly with two ventral subbasal diverticulae and two small subapical diverticulae, one with a patch of spine-like cornuti. **Female genitalia.** Unknown.



FIGURES 4–8. Male genitalia of *Lithophane* species. **4)** *L. lanei*; **5)** *L. scottae*; **6)** *E. boogeri*; **7)** *L. longior* (tip of valve); **8)** *L. subtilis* (tip of valve).



FIGURES 9–10. Female genitalia of *Lithophane* species. 9) *L. lanei*; 10) *L. boogeri*.

Type material. Holotype male: Canada, Ontario, [Ottawa], Carp Ridge, E. side, 45°24.63'N, 76°03.45'W, 16 April 2005, Lynn Scott (CNC). Paratype: **Ontario:** 1 male, Frontenac Co., Perth Road, 11 May 1971, P. Ward (CNC).

Derivation of the name. I name this species for Lynn Scott, who collected the holotype.

Distribution and habitat. *Lithophane scottae* has been collected in hardwood forests in eastern Ontario. Nothing is known of its life history.

***Lithophane boogeri* new species**

(Figs. 3, 6, 10)

Diagnosis. *Lithophane boogeri* has been confused with *L. longior* (Smith) in collections. It is separated from it by the male genitalia: the apex of the valve is broad with a heavy, rugose spinelike process on the ventral margin in *L. boogeri* (Fig. 6), much narrower, with a smaller spine-like process apically and with a ventral lobe in *L. longior* (Fig. 7). Externally these species are similar with the same range of variation from even gray to mottled gray with fine black etching in the postmedial area. They may also be separated by range: *L. boogeri* occurs in association with *Juniperus occidentalis* in the western and northwestern Great Basin and *L. longior* occurs from Colorado, south into Arizona, New Mexico, and western Texas, following the distribution of *Juniperus monosperma* (Engelm.) Sarg. *Lithophane subtilis* is another juniper feeding species that occurs in southwestern California. The tip of valve is also wide, but unlike *L. boogeri*, the digitus is well developed (Fig. 8).

Description. (Fig. 3). Holotype: Forewing length 20 mm. Antenna filiform, ciliate; eye orbicular, lashed; head, palpus, prothoracic collar, tufted thorax and tegula gray. Dorsal forewing gray with slightly darker median shade; orbicular and reniform spots obscure, only very slightly lighter gray than rest of wing. Fringe gray. Dorsal hindwing even gray brown with slightly darker discal lunule; fringe pale gray, darker at base. **Male genitalia** (Fig. 6). Costa of valve broadly sclerotized, becoming broader subapically, narrowing to a rugose, ventrally directed point. Cucullus absent. Digitus vestigial. Fleshy lobe on ventral margin of valve near apex. Clasper arcs upward and then downward to approach dorsal apex of valve. Uncus thickens slightly medially, splayed laterally at apex. Vesica bulbous, bending upward and to the right with two small subapical diverticulae; cornuti absent. **Female genitalia** (Fig. 10). Ostium bursae heavily sclerotized laterally; ductus bursae with heavily sclerotized ventral plate that twists around to dorsal surface at appendix bursae. Appendix bursae reduced to a swelling at base of ductus seminalis. Bursa bean-shaped, signa absent. Ovipositor lobes with fine setae.

Type material. Holotype male: USA, Oregon, Deschutes Co., Barr Rd., 6 mi N Tumalo, 7 April, 1996, J. & L. Troubridge (CNC). Paratypes: **Oregon:** 12 males, 8 females, same data as holotype. Paratypes in the CNC and JTT.

Derivation of the name. I name this species for my cat, Booger, who is keenly interested in entomological gastronomy.

Distribution and habitat. *Lithophane boogeri* occurs in association with *Juniperus occidentalis* in Idaho and the Oregon high desert. *Juniperus occidentalis* also occurs in eastern California and extreme northwestern Nevada where *L. boogeri* is expected to occur.

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