A NEW SPECIES OF *LITHOPHANE* (LEPIDOPTERA: NOCTUIDAE: CUCULLIINAE) FROM NORTHEASTERN NORTH AMERICA

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ABSTRACT: A new species of noctuid moth is described and illustrated, *Lithophane thujae*, new species, is known from two localities in New Brunswick, Canada, and one locality each in Michigan and Wisconsin, U.S.A. The probable larval host plant is northern white-cedar (arbor vitae), *Thuja occidentalis* L. (Cupressaceae). Notes on its biology are given and the last instar larva is figured.


In late April 1990 a female specimen of an unusual *Lithophane* was collected at mercury vapor (M.V.) light by the authors a few km south of Harvey Station, York Co., New Brunswick. This specimen was tentatively identified at *Lithophane* species near *lemmeri* Barnes & Benjamin by Donald Lafontaine of the Biosystematics Laboratory, Ottawa, Canada. Another female of this species was collected at M.V. light by the senior author near Fredericton, York Co., N.B., in early June 1992. Eggs were obtained from this female and neonate larvae were given a choice of 21 species of woody shrubs and trees from the area where the moth was collected. The larvae refused to feed on the foliage of all species except northern white cedar, *Thuja occidentalis* L. (Cupressaceae). Larvae were reared on the foliage of *T. occidentalis*, and adults were produced in late September, 1992. Additional specimens were reared in 1996 from another female collected at the locality near Fredericton in early May at M.V. light. Another two specimens of this species from Michigan and one from Wisconsin were located in the respective collections of Mogens C. Nielsen and James C. Parkison. These had been identified as *Lithophane* new sp. near *lemmeri* by Dale F. Schweitzer. Comparison of the male genitalia of these moths to those of *L. lemmeri*, which occurs along the Atlantic coast of the U.S.A., demonstrated that this *Lithophane* was not conspecific with *L. lemmeri*. We therefore describe this insect as a new species.

*Lithophane thujae* Webster and Thomas, new species

(Figs. 1, 2, 6, 7)

Description (Figs. 1 and 2). Forewing narrow, length 16.0–18.1 mm (mean = 17.2), width at termen 6.0–7.5 mm (mean = 7.0) (n = 24) in males and length 16.0–18.5 mm (mean = 17.3), width at termen 6.0–8.0 mm (mean = 7.2) (n = 46) in females. Anterior half of termen at nearly right angle with distal 1/3 of costa, then angled inwards toward termen at approximately a 135° angle; lower half of termen slightly emarginated above termen. Forewing above brownish gray grading to light gray near the anterior margin basally and brown with pinkish hue along posterior margin becoming salmon pink near base of wing. Reniform spot indistinct, dirty salmon pink, basal portion contrasting with lighter gray anterior portion. Orbicular spot absent. Basal dash consists of thin black line. Thicker black median streak between indistinct antemedial and postmedial lines, and well developed subreniform black line outlined anteriorly with white. Apical dash small, black and subterminal line indicated by series of 4 black dashes, most anterior connected to brownish apical streak. Hindwing above darker than forewing and grayish brown with salmon pink hue, discal dot faintly expressed. Fringes of both wings concolorous with adjacent portions of wing. Underside of fore- and hindwings uniformly light gray with strong salmon pink tint except for darker central area of forewing. Discal spot on underside of hindwing well developed. Color and pattern similar in both sexes and uniform among specimens examined. Dorsal side of thorax gray with mid-dorsal brown patch bisected by fine white line extending from collar to base of abdomen. Tegula elongated and gray, margined with black above wing base. Anteriorly, mesothoracic vestiture terminates in V-shaped crest. Patagium concolorous with tegula, but bordered posteriorly towards mid-line by fine black line followed by white line. These lines on adjacent patagia form a V, opening formed by thoracic crest which emerges between arms of V. Head vestiture, dor­sally, concolorous with patagia and tegulae. Palpi and ventral thoracic gray with definite pinkish hue. Dorsally, abdomen gray with pinkish hue and without tufts; ventrally abdomen approaches dirty salmon pink. Prothoracic legs entirely dirty salmon pink. Outer lateral portions of femur and tibia of meso- and metathoracic legs black, remainder of legs salmon pink.

Male genitalia (Fig. 6). The interpretation of male genitalia was based primarily on Sibatani et al. (1954). Basal part of valve, composed of dorso-proximal costa and ventro-proximal saccus, well developed. Heavily sclerotized costa forms right angle at junction of its dorso-proximal and proximal margins. Valvula, ventro­tégumental region of valve beyond membranous annellifer, narrower than basal part of valve, but of equal length. Valvula gradually tapers to simple narrowly rounded apex and lacking digitus. Relatively short harpe curved to form open half circle with its opening facing ventro-apically and inner diameter of 0.5 mm. Transtilla curved with its smaller diameter on its mesal surface. Vinculae beyond ventral edge of saccus form V-shaped structure with length longer than width. Two vinculae meet at acute angle. Juxta ends in two heavily sclerotized points forming shallow V, with depth of V equal to half width of juxta at level of base of V. Uncus terminates in widened tip with slight bifurcation. Male genitalia is bilaterally asymmetrical, with apical portion of left valvula being broader than right.

Female genitalia (Fig. 7). Similar to, but smaller than L. lemmeri (Fig. 6c). Major structural difference is in ventral edge of ostium. In L. thujae, sterigma is non-sclerotized and forms a straight, horizontal, edge. It is totally overshadowed by heavily sclerotized lamella antevaginalis which is deeply invaginated giving ostium an apparent V-shaped opening. In L. lemmeri, sterigma is distinct, sclerotized, and has wavy edge.

Diagnosis. The forewing pattern of L. thujae (Figs. 1 and 2) is similar to that of L. lemmeri (Figs. 3 and 4), but the markings are bolder and more completely developed in L. thujae. In L. lemmeri, the wings are a uniform dirty brownish gray, the black median streak between the antemedial and postmedial lines is poorly developed, and the subreniform line is less developed and not outlined anteriorly with white. Rubbed specimens may be mis-identified as L. lemmeri, but the forewing patterns of fresh specimens of the two species are distinctly different (Figs. 1–4). L. lemmeri has longer narrower wings: forewing length 20.0–20.5 mm, width 7.0 mm (n = 4). The male genitalia of L. thujae and lemmeri are also substantially different (Figs. 6 and 8). In L. lemmeri (Fig. 6a), valvula has an expanded costal bulge towards its apex to form a rounded protuberance on its mesal surface and then narrows to form a distinctively bifurcate tip, with the dorsal branch twice as long as the ventral branch (digitus). In L. thujae the valvula (Fig. 6a) lacks a costal bulge and gradually tapers to a simple narrowly rounded tip, without a digitus.

Types. Holotype male (Fig. 1): CANADA, NEW BRUNSWICK, York Co., 5.3 km SW of Jet. of Hwy. 101 and Charters Settlement Rd. (45°50′38″N, 66°44′31″W), ex ovum from female collected at M.V. light 1 June 1992, reared on T. occidentalis, emerged 24 September 1992, R. P. Webster. Allotype female (Fig. 2): same locality and data as male. 1-4 November 1994, D. P. Schweitzer. 4, Lithophane lemmeri, female, same data as male. 5, Mature larva of Lithophane thujae on Thuja occidentalis. Length 30 mm. Reared ex ovum from a female collected at M.V. light on 3 May 1996 at New Brunswick, York Co., R. P. Webster.

Lithophane thujae is a member of an assemblage of Lithophane species which feed during the larval stage.
on members of the Cupressaceae. These species include *L. lemmeri* from the Atlantic coastal plain of the U.S.A. from Connecticut southward (Dale F. Schweitzer, pers. comm.); *L. subtilis* Franclemont, *L. tarda* (Barnes and Benjamin), and *L. longior* (Smith) from southwestern North America (Franclemont 1969); and the Palaeartic *L. leautieri* Boursin (Bretherton et al. 1983). None of these species has a combination of wing pattern and male genitalia similar to *L. thujae* (Barnes and Benjamin 1929, Boursin 1971, Bretherton et al. 1983, Franclemont 1969). Although the wing pattern of the more northern *L. thujae* and *L. lemmeri* are similar, the genitalia of the two are very different.

Very few field-collected specimens are currently known of *L. thujae*. The reason for this apparent rarity is unclear. Possibly *L. thujae* is less attracted to light or bait than other *Lithophane* species, or has very specific habitat requirements. The current distribution includes only New Brunswick, Michigan, and Wisconsin. However, it is likely that this species will be found in the intervening areas in Maine, northern New Hampshire, Quebec and Ontario once more collecting is done in habitats with *T. occidentalis*.

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**LITERATURE CITED**


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