

Pterophoridae recorded on Block Island (Rhode Island, USA), 2018-2019

Aaron Hunt¹ and Deborah L. Matthews²

¹100 Suffolk Road, Newton, MA 02467 blockislander1@gmail.com

²McGuire Center for Lepidoptera and Biodiversity, Florida Museum of Natural History, P.O. Box 112710, Gainesville, FL 32611-2710 dlott@flmnh.ufl.edu

Introduction

Plume moths are small to medium-sized slender bodied moths with wings divided into fringed lobes resembling feathers or “plumes”. These moths are easily recognized in the field by their characteristic T-shaped resting posture. There are about 166 species in the Nearctic Region. As part of an ongoing survey of the moths of Block Island, a systematic effort was made in 2019 to document this moth family on the island.

The current moth survey of Block Island aims to produce a species checklist as well as detailed data on the phenology, abundance, and local distribution of each species. Regular black lighting at sites throughout the island and nightly surveying at the Hunt property in the summers of 2018 and 2019, with records kept of all individual moths sighted (with sight identifications in some cases only to genus), has generated over 20,000 data points.

Block Island is a small (25 km²) island about 15.1 km south of the coast of mainland Rhode Island and 22.5 km north-east of Montauk Point on Long Island, New York. Much of the island is agricultural fields, brushland and forest, with bayberry (*Myrica pensylvanica* Mirbel) and black cherry (*Prunus serotina* Ehrh.) the dominant floral components of the latter two habitats.

Methods

In 2019, 218 plume moths were collected on Block Island as part of an ongoing survey of the island's moth fauna. This family was not a significant target of collecting efforts in prior years, though 10 specimens collected in 2018 were also identified. 156 of the plume moths collected in 2019 were taken during nightly moth surveys at fixed MV lights at the home of Aaron Hunt (41.1950°, -71.5652°), 56 at a number of locations using a black light and sheet (some found flying or resting well away from sheets), and six by Nigel Grindley at his fixed MV lights (41.1615°, -71.6050°). No attempts were made to search for larvae or collect in the daytime.

Most superficially similar tan or white *Hellinsia* individuals encountered in the 2019 survey at the Hunt home lights and at black lights were collected; due to time constraints, a small portion were not collected as vouchers and therefore were not identified. Similarly, all

unrecognized specimens and those requiring dissection for identification were collected, with the exception of a small number that escaped capture. All recognized specimens not collected were recorded as well. Surveys at the Hunt property were conducted on 80 nights in 2019, mostly from early June to mid-August; 27 nights of black lighting at locations around the island were conducted as well.

External examination of genitalia was helpful in confirming identifications in males. In cases where dissection was necessary for identification of males or females, abdomens were removed and macerated in heated 10% KOH. After cleaning and light staining with chlorazol black, abdomens were either placed in small glycerin vials on the same pin with the adult or slide mounted in Euparal as numbered dissections. Label data for all specimens includes: “Rhode Island, Washington Co., Block Island” along with GPS coordinates, collection date, collector(s), and UV vs. MV lights. GPS coordinates are indicated below in “specimens examined” sections and ordered by collecting site coordinates, date, specimen number, and repository. All specimens were collected by Aaron Hunt except where indicated. Wing expanse ranges in diagnoses are reported for Block Island material only. Specimens are deposited in the McGuire Center for Lepidoptera, Florida Museum of Natural History, Gainesville, Florida [MGCL], Cornell University Insect Collection, Ithaca, New York [CUIC], and the National Museum of Natural History, Washington, D.C. [USNM]. Image vouchers are available on BugGuide.net. Color terminology mentioned in diagnoses is adapted from Ridgway (1912).

Results

Along with image vouchers, 228 specimens were collected in 2018-19. Fourteen species of Pterophoridae were recorded and are listed below with comments on phenology and known hostplants present on the island. Previously known larval hostplants for each species reported below are derived from Matthews and Lott (2005). Occurrence of host plants on the island is based on the flora listed by Patton et al. (2002).

Systematic recording of specimens not collected each night in 2019 allowed for estimation of the local phenology of the commoner species (Fig. 1). By far the most abundant species at the Hunt property and likely across the entire island is *Hellinsia glenni* (Cashatt), a borer in goldenrod

(*Solidago* L.) with a peak flight time locally in late June and early July.

***Platyptilia carduidactylus* (Riley)**

Diagnosis – Wing expanse 18–20 mm. Forewing light brown to drab with dark brown and white markings; a characteristic dark brown or fuscous triangle extends from costa to cleft base. Both forewing lobes with a narrow white subapical stripe. Hindwing drab with triangular fuscous scale tooth in fringes near middle of third lobe anal margin.

Specimens Examined – (1 ♂) 41.1950°, -71.5652°, 12.vii.2019, PTERO1759 [MGCL]; (1 ♂) same location, 18.vii.2018, PTERO1761 [MGCL]; (1 ♂) 19.vii.2019, PTERO1760 [MGCL].

Comments – Larvae infest artichokes (*Cynara scolymus* L.) in California and feed in the heads, shoots, and stems of various other thistle species, especially *Cirsium* L. Five species of *Cirsium* occur on Block Island including *C. arvense* (L.) Scop., *C. discolor* (Muhl.) Spreng., and *C. vulgare* (Savi) Tenore, all of which have been recorded as hosts in other parts of the range. Block Island specimens were collected in July. Multiple broods or flights are known in other parts of the species range.

Distribution – This species occurs across the USA and Canada and extends to a limited extent into Mexico. The distribution of natural populations is not entirely clear as specimens are often encountered in artichokes at grocery markets.

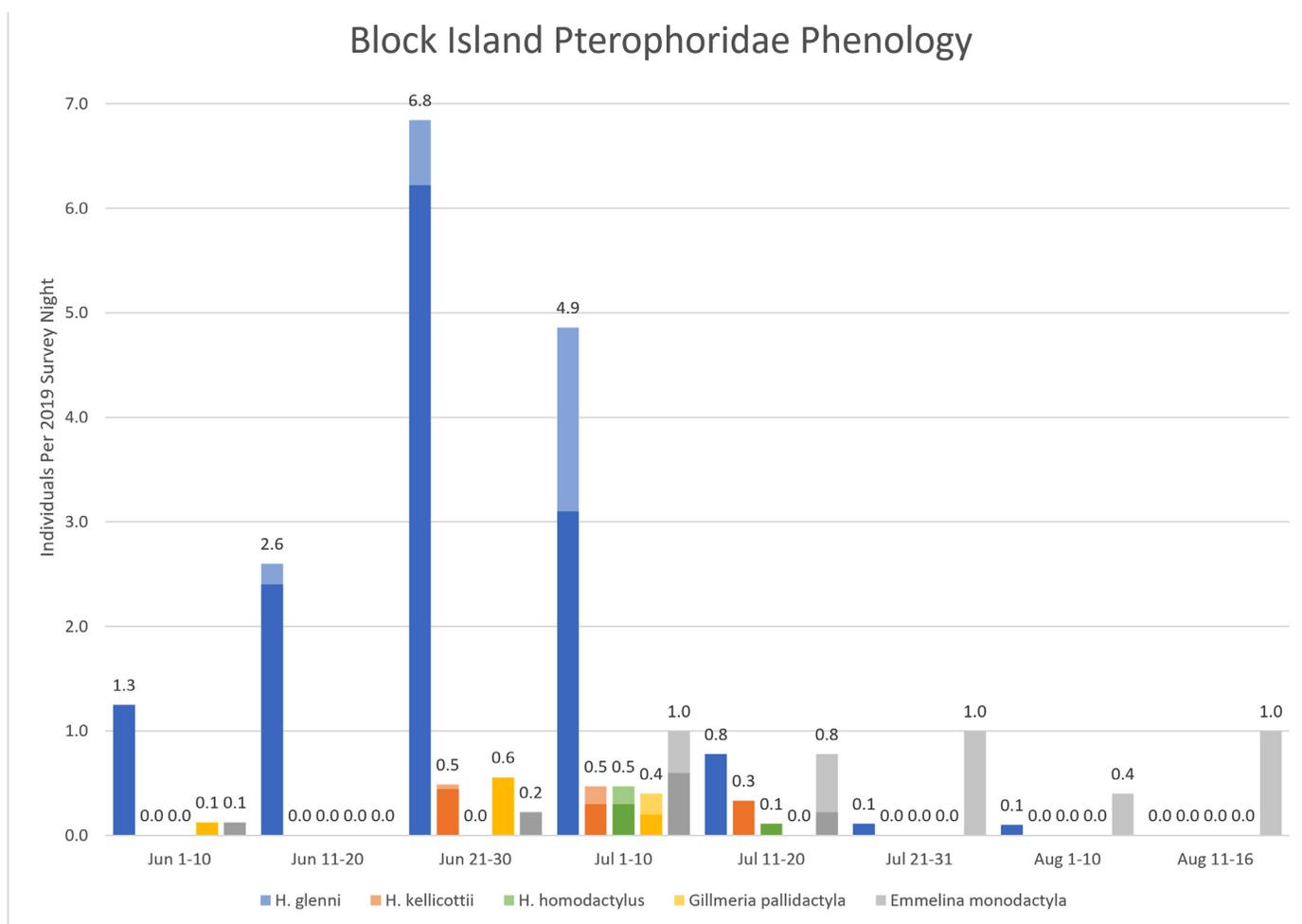


Figure 1. Comprehensive observation data, sorted by 1/3 month periods, for five species during nightly observations at the Hunt property 1 June to 16 August 2019. These species together accounted for 208 of 214 plume moths observed at the site over this period. The abundance of each species is expressed in individuals per night of surveying in each 1/3 month period. For each species, numbers of collected voucher specimens are represented in a darker shade, and individuals not collected in a lighter shade. The 28 *Hellinsia* not collected (all between 20 June and 7 July, inclusive) were left at random and not based on superficial appearance; therefore, they are assumed in the analysis to have been composed of the three similar collected species in the same proportions as the collected specimens were. The specimens not collected in each 1/3 month period were therefore apportioned in the graph to each of those three recorded species according to its representation among the specimens collected over that period. (Note that the earliest record on Block Island of *H. balanotes* is 15 July 2018.)

Gillmeria pallidactyla (Haworth)

Diagnosis – Wing expanse 18–25 mm. Head with distinctive conical frontal tuft. Forewing mottled, lobes light buff or cream buff, grading distally to drab or buffy brown, subapical narrow pale line sometimes distinguishable, especially on first lobe; discal area drab to buffy brown with elongate buff area near middle. Hindwing uniform drab to buffy brown, some dark brown scales sometimes present within hindwing third lobe anal fringe near middle but not forming a distinct scale tooth as in *P. carduidactylus*. Pale or worn specimens with forewing appearing mostly light buff except drab near cleft base.

Specimens Examined – (1 ♂) 41.1654°, -71.5884°, 1.vii.2019, PTERO1813 [CUIC]; (1 ♂) 41.1683°, -71.5852°, 22.vi.2019, PTERO1805, [MGCL]; (1 ♂) 41.1950°, -71.5652°, 6.vi.2019, PTERO1811 [MGCL]; (1 ♂) same location, 9.vi.2019, PTERO1803 [USNM]; (1 ♂) 21.vi.2019, PTERO1810 [MGCL]; (1 ♂) 23.vi.2019, PTERO1806 [MGCL], (1 ♂) 24.vi.2019, PTERO1808 [MGCL]; (1 ♂) 26.vi.2019, PTERO1812 [MGCL]; (1 ♂) 27.vi.2019, PTERO1804 [MGCL]; (1 ♀) 2.vii.2019, PTERO1809 [MGCL]; (1 ♂) 41.2062°, -71.5583°, 17.vi.2019, PTERO1807 [MGCL].

Comments – Larvae overwinter within rootstocks of *Achillea millefolium* L. and feed within shoots, leaf axils, or incipient inflorescence clusters in the spring. Adults on Block Island were collected early June through the first week of July.

Distribution – This Holarctic species occurs across Canada and most of the northern half of the USA and further south in higher elevations where the hostplant grows.

Stenoptilia pallistriga Barnes & McDunnough

Diagnosis – Wing expanse 18.5 mm. Forewing pale brown with scattered white and fuscous scales, fuscous minute discal spot, fuscous double spot at cleft base, and fuscous spatulate scales within fringes of first and second lobe termen. Distinguished from other *Stenoptilia* by a pale oblique dash on the first lobe. Hindwing pale brown with a small subapical tuft of fuscous scales on first lobe.

Specimens Examined – (1 ♂) 41.1681°, -71.5859°, 8.vi.2019, PTERO1780 [MGCL], abdomen missing.

Comments – Life history unknown. Based on hostplants used by congeners (Matthews and Lott 2005), plants of the families Gentianaceae, Plantaginaceae, and Lamiaceae should be checked on Block Island. This is the northernmost USA record. There is, however, a specimen from Ontario, Canada in the Canadian National Collection. The Block Island specimen was collected in June. The species occurs in all months of the year in the southern USA.

Distribution – USA: AL, AR, FL, LA, MS, TX, RI, VA. CANADA: Ontario. Recorded in the neotropics from

Dominica, Ecuador, Jamaica, Paraguay, and Surinam (Gielis 2003, 2006).

Lioptilodes albistriolatus (Walsingham)

Diagnosis – Wing expanse 13 mm. Forewing drab-gray with fuscous discal spot and double spot at cleft base. A white dash along costa on first lobe adjacent to fuscous basal area. Discal cell pleated along middle. Hindwing uniform drab.

Specimens Examined – (1 ♂) 41.1950°, -71.5652°, 21.ix.2019, PTERO1818 [MGCL].

Comments – Larvae feed in the flower heads of various Asteraceae. Previously recorded hostplant genera which occur on Block Island are *Symphyotrichum* Nees, (formerly *Aster* L.), *Baccharis* L., *Conyza* Less., *Erigeron* L., and *Solidago* L.

Distribution – This species occurs throughout the Neotropical and Nearctic Regions. Adults are found in all months in the southern USA and are most frequently encountered in association with fall composite flowering times. The Block Island specimen is a northern record for this species.

Geina periscelidactylus (Fitch)

Diagnosis – Wing expanse 17–19 mm. Forewing clay color to ochraceous-tawny, banded on lobes, each with a narrow white subapical line, a broad cinnamon-brown band covering middle third, and a narrow white band basad; a short cinnamon brown to fuscous line at discal cell end near cleft base. Hindwing cinnamon-brown to russet except third lobe with middle third white, distal third russet with tuft of fuscous scales mixed in fringes. Legs banded cinnamon-brown and white. A similar species, *G. sheppardi*, though not yet recorded, may also occur on the island. The latter may be distinguished by its darker ground color and characters of the male and female genitalia.

Specimens Examined – (3 ♂) 41.2080°, -71.5607°, 5.vii.2019, PTERO1781, 1784 [MGCL], PTERO1782 [USNM]; (1 ♂) 41.1950°, -71.5652°, 6.vii.2019, PTERO1783 [CUIC].

Comments – Larvae feed on grape leaves. Two species of *Vitis* L. occur on Block Island, one of these, *V. labrusca* L. is a previously recorded host for *G. periscelidactylus*. Adults on Block Island were collected in early July.

Distribution – This species occurs in the eastern part of the USA and Canada, extending west into Manitoba and eastern Texas and south into Georgia but not reaching Florida.

Geina buscki (McDunnough)

Diagnosis – Wing expanse 16 mm. Forewing garnet brown to russet with a slight metallic cast. Lobes with variably expressed white oblique lines at one and two thirds from

apex. Hindwing brown to russet except middle third of anal lobe white, distal third with distinct scale tooth comprised of fuscous spatulate scales mixed with fringes on both margins. Distinguished from *G. periscelidactylus* and *G. sheppardi* in having distinct lateral patches of white scales on metathorax. *Geina buscki* and *G. tenuidactylus* are distinguishable only by genitalia. Males can be identified without dissection by brushing away scales to examine the shape of the valvae tips. In *G. buscki* these are asymmetrical with one valve tip crossing over the other whereas the valvae tips are symmetrical and not crossed in *G. tenuidactylus*. Females have only slight differences in the shape of the antrum and are very difficult to identify.

Specimens Examined – (1 ♂) 41.1662°, -71.5880°, 1.vii.2019, PTERO1779 [MGCL].

Comments – Larvae of both *G. buscki* and *G. tenuidactylus* are reported to feed on *Rubus* L. (Rosaceae). The one specimen examined from Block Island is indeed *G. buscki*. There are however, several image vouchers which cannot be determined as one or the other since it is likely that *G. tenuidactylus* also occurs on the island. Six species of *Rubus* occur on Block Island, of these, *R. allegheniensis* T.C. Porter is a previously known host for *G. tenuidactylus*.

Distribution – The distribution of this species is poorly known since many published records may refer to either *G. buscki* or *G. tenuidactylus*. The two species do occur together in some areas.

Dejongia lobidactylus (Fitch)

Diagnosis – Distinguished from other species on Block Island by the narrow banded forewing lobes without a distinct termen and characteristic striping pattern on the abdomen. Forewing ground color ochraceous-tawny to chestnut-brown. Chestnut-brown to fuscous bands at middle third of first lobe bordered by white. Hindwing chestnut-brown, with fuscous scale tooth on distal third of third lobe anal margin, flanked by small patch of white fringe scales.

Specimens Examined – None.

Image vouchers – Block Island, 15.vii.2019, by Nigel Grindley, (<https://bugguide.net/node/view/1697541>).

Comments – Larvae feed externally on shoots and new leaves of *Solidago* L. Ten species occur on Block Island, including the previously recorded host species *S. rugosa* Mill. and *S. canadensis* L.

Distribution – This species ranges across the southern half of Canada as far west as Alberta and across the northeastern USA to Montana and south as far as New Jersey. The distribution in the west may overlap with *Dejongia californicus* (Walsingham), though the two species are widely separated in the eastern USA where *D. californicus* is restricted to the south.

Hellinsia inquinatus (Zeller)

Diagnosis – Wing expanse 17 mm. Forewing mottled gray with two dark gray dashes along the costa and diffuse gray spots at cleft base and middle of discal cell. Hindwings uniformly drab. Distinguished from *Adaina ambrosiae* (Murtfeldt) by the more diffuse markings, absence of cream-buff scales on the forewing, and paired, as opposed to single middorsal dark spots on the abdomen.

Specimens Examined – (1 ♂) 41.1950°, -71.5652°, 28.vi.2019, PTERO1757 [MGCL]; (1 ♀) same location, 17.viii.2018, PTERO1758 [MGCL].

Comments – Larvae feed externally on shoots of *Ambrosia artemisiifolia* L.

Distribution – This species is widespread across the USA and southern Canada.

Hellinsia homodactylus (Walker)

Diagnosis – Wing expanse 21–23 mm. Forewing pure white with a diffuse gray spot basad of cleft and scattered gray scales along costa and first lobe. Some, especially worn specimens, completely white. Hindwing uniform white to pale gray. The species is very similar to *Hellinsia elliottii* which although not yet found on Block Island, may occur there. The two species can only be separated by genitalia dissection. Males differ in the curvature of the saccular process of the left valve and females by the shape of the antrum.

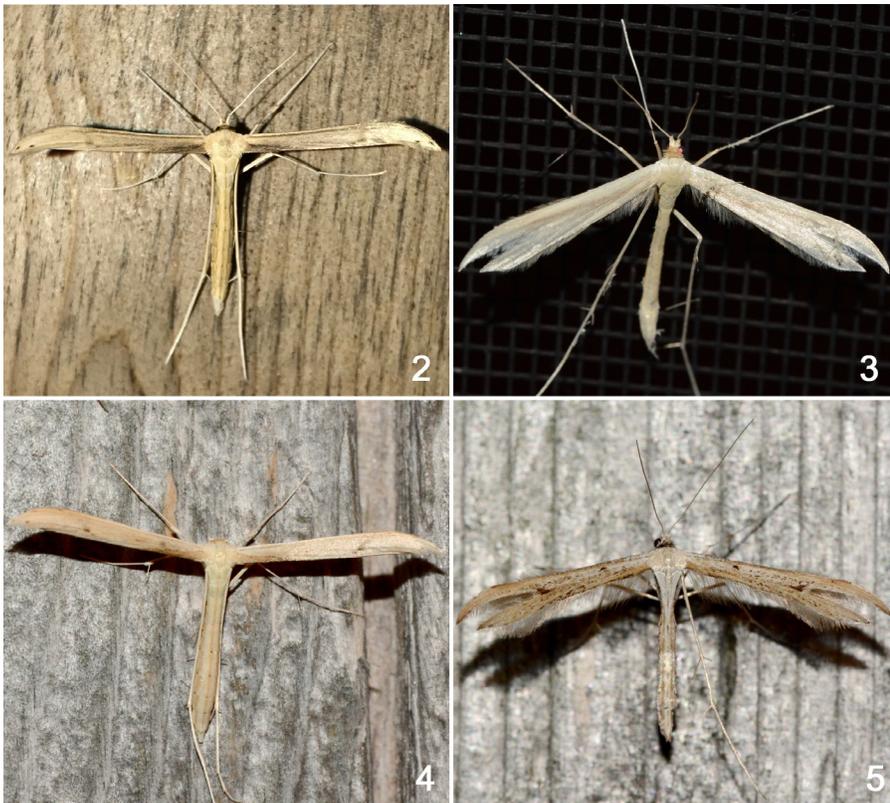
Specimens Examined – (1 adult, abdomen missing) 41.1950°, -71.5652°, 2.vii.2019, PTERO1815 [MGCL]; same location, (1 ♀) 8.vii.2019, PTERO1816 [CUIC]; (1 ♀) 9.vii.2019, PTERO1817 [MGCL]; (1 ♀) 17.vii.2019, PTERO1814 [MGCL].

Comments – Larvae feed externally on shoots and young leaves of *Solidago*, including *S. canadensis* and *S. rugosa*.

Distribution – This species occurs across Canada and in the northeastern USA it extends west to Minnesota and south as far as northern Georgia. Additional records in the western USA need verification.

Hellinsia balanotes (Meyrick) (Fig. 2)

Diagnosis – Wing expanse 27–38 mm. Ground color cream-buff to deep olive-buff with vein terminals and cleft base of forewing marked by one or more fuscous scales and a diffuse median line of fuscous scales along basal third of wing. Best distinguished from similar species, *H. kelicottii* (Fish) and *H. glenni* (Cashatt) by male and female genitalia characters described and illustrated by Cashatt (1972). These include the saccular process of the left valve in males and the shape of the anterior margin of the 8th tergite in females. In males, the saccular process of both *H. kelicottii* and *H. balanotes* is filamentous and terminates



Figures 2–5. Some examples of Pterophoridae collected on Block Island. **2)** *Hellinsia balanotes* male, 11.viii.2019, PTERO1753. **3)** *H. glenni* male, 15.viii.2019, PTERO1838. This worn specimen lacks forewing markings and exemplifies the necessity of genitalia characters for identifications. **4)** *H. glenni*, female, 15.vii.2019, PTERO1912. Note striking similarity to *H. balanotes* above, with only slightly paler markings. **5)** *Emmelinea monodactyla*, female, 1.vii.2019, PTERO1793.

in a finely drawn point, usually extending beyond the tip of the valve in *H. balanotes*.

Specimens Examined – (1 ♂) 41.1950°, -71.5652°, 15.vii.2018, PTERO1747 [MGCL]; (1 ♂) same location, 4.viii.2019, PTERO1748 [CUIC]; (1 ♂, prep. DM 2333) 11.viii.2018, PTERO1753 [MGCL]; (2 ♀) 41.2018°, -71.5775°, 24.vii.2019, PTERO1752, 1754 [MGCL]; (1 ♂) 41.2020°, -71.5778°, 21.ix.2019, PTERO1755 [MGCL]; (2 ♂) 41.2020°, -71.5778°, 21.ix.2019, A.S. Hunt, N.D.F. Grindley PTERO1751, 1755 [MGCL]; (2 ♂) 41.2021°, -71.5786°, 21.ix.2019, A.S. Hunt, N.D.F. Grindley, PTERO1749, 1756, [MGCL], (2 ♀) same data, PTERO1746, 1750 [MGCL].

Comments – The wing expanse reported by Cashatt 31–42 mm. While most specimens fall within this range, one small female was determined on the basis of the rounded 8th tergite anterior margin. Wing expanses overlap for all three *Hellinsia* stem borers on Block Island. Larvae are stem borers in *Baccharis halimifolia* L. Adults were collected July through September.

Distribution – This species has an Atlantic and Gulf Coastal Plain distribution associated with *B. halimifolia* and *B. angustifolia* Michx. as well as a spotty distribution in the southwest corresponding to that of two other *Baccharis*

species. The Block Island specimens appear to be the northernmost records for the species, though the hostplant does occur further north in Massachusetts (USDA, NRCS 2006).

***Hellinsia kellicottii* (Fish)**

Diagnosis – Wing expanse 22–28 mm. Color and maculation similar to *H. balanotes* except somewhat paler, median line of fuscous scales at basal third of forewing lacking, and specimens generally less robust. Characters of the male and female genitalia, as noted above, are the most reliable means of identification.

Specimens Examined – (2 ♂) 41.1950°, -71.5652°, 22.vi.2019, PTERO1770, 1772 [MGCL]; (1 ♂) 41.1950°, -71.5652°, 26.vi.2019, PTERO1771 [MGCL]; (1 ♂, prep. DM 2334) same location, 28.vi.2019, PTERO1765 [MGCL]; (1 ♀) 2.vii.2019, PTERO1763 [MGCL]; (1 ♂) 6.vii.2019, PTERO1766 [MGCL]; (1 ♂) 8.vii.2019, PTERO1769 [MGCL]; (1 ♂) 12.vii.2019, PTERO1768 [MGCL]; (1 ♂, prep. DM 2332) 13.vii.2019, PTERO1762 [MGCL]; (1 ♂) 17.vii.2019, PTERO1764 [MGCL]; (1 ♂, prep. DM 2335) 41.2021°, -71.5786°, 21.ix.2019, PTERO1767 [MGCL].

Comments – Larvae are stem borers of *Solidago*, including *S. canadensis*. Adults were collected from June to September. Cashatt (1972) reported a broader wing expanse range of 20–28 mm.

Distribution – This species has been recorded across the southern part of Canada and throughout most of the eastern USA as far west as Colorado. The species likely has a much broader distribution corresponding to that of the host which occurs throughout most of the USA and Canada.

***Hellinsia glenni* (Cashatt) (Fig. 3, 4)**

Diagnosis – Wing expanse 18–31 mm. Similar to *H. balanotes* and *H. kellicottii* with minute forewing markings at cleft base and vein terminals on both lobes. Males are identified by looking for the swollen or flattened tip of the left valve saccular process terminating in a minute hook (see Cashatt 1972). This character can usually be found without dissecting. Females require dissection and light staining and are recognized by the double layered cuticular band across the anterior margin of the 8th tergite (Cashatt 1972).

Specimens Examined – (3 ♂) 41.1496°, -71.5883°, 28.vi.2019, PTERO1893, 1931, 1962 [MGCL]; (1 ♀) same

data, PTERO1905 [MGCL]; (1 ♂) 41.150°, -71.588°, 28.vi.2019, PTERO1850 [MGCL]; (1 ♂) 41.1615°, -71.6050°, 15.vii.2019, N.D.F. Grindley, PTERO1838 [USNM]; (1 ♀) same data, PTERO1912 [MGCL]; (1 ♂) same location, 17.vi.2019, N.D.F. Grindley, PTERO1972 [MGCL]; (1 ♂) 41.166°, -71.588°, 1.vii.2019, PTERO1852 [CUIC]; (1 ♂) same data, PTERO1854 [MGCL]; (1 ♂) 41.1662°, -71.5880°, 1.vii.2019, PTERO1851 [MGCL]; (1 ♀) 41.1669°, -71.5728°, 27.vi.2019, PTERO1907 [MGCL]; (1 ♂) 41.1681°, -71.5859°, 9.vii.2019, PTERO1916 [MGCL]; (1 ♂) 41.1682°, -71.5859°, 22.vi.2019, PTERO1849 [MGCL]; (1 ♂) 41.1683°, -71.5852°, 8.vi.2019, PTERO1876 [MGCL]; (2 ♀) same data, PTERO1823, 1904 [MGCL]; (2 ♂) same location, 22.vi.2019, PTERO1939 [USNM], PTERO1947 [MGCL]; (1 ♀) 41.1950°, -71.5652°, 3.vii.2018, PTERO1911 [MGCL]; (2 ♂) same location 3.vi.2019, PTERO1965 [CUIC], PTERO1966 [MGCL]; (1 ♂) 7.vi.2019, PTERO1967 [USNM]; (6 ♂) 9.vi.2019, PTERO1970, 1971 [CUIC], PTERO1833, 1834, 1968 [MGCL], PTERO1836 [USNM]; (1 ♀) same data, PTERO1902 [MGCL]; (1 ♂) 12.vi.2019, PTERO1837 [USNM]; (11 ♂) 17.vi.2019, PTERO1889, 1954 [CUIC], PTERO1826, 1832, 1835, 1894, 1895, 1897, 1973 [MGCL], PTERO1890, 1969 [USNM]; (3 ♂) 21.vi.2019, PTERO1891, 1896, 1898 [MGCL]; (3 ♂) 22.vi.2019, PTERO1892, 1899, 1901 [MGCL]; (6 ♂) 23.vi.2019, PTERO1951, 1952, 1955, 1964 [MGCL], PTERO1843, 1845 [USNM]; (8 ♂) 24.vi.2019, PTERO1831, 1839–1842, 1880, 1920 [MGCL], PTERO1870 [USNM]; (1 ♀) same data, PTERO1829 [MGCL]; (9 ♂) 26.vi.2019, PTERO1867, 1938, 1940, 1942, 1944, 1945, 1948, 1950 [MGCL], PTERO1874 [USNM]; (5 ♂) 27.vi.2019, PTERO1941 [CUIC], PTERO1943, 1946, 1949 [MGCL], PTERO1930 [USNM]; (3 ♂) 28.vi.2019, PTERO1888, 1960 [MGCL], PTERO1929 [USNM]; (2 ♀) same data, PTERO1830, 1906 [MGCL]; (5 ♂) 29.vi.2019, PTERO1963 [CUIC], PTERO1819, 1958, 1959 [MGCL], PTERO1961 [USNM]; (9 ♂) 30.vi.2019, PTERO1853, 1855–1861, 1864 [MGCL]; (2 ♀) PTERO1828, 1910 [MGCL]; (2 ♂) 1.vii.2019, PTERO1956, 1868 [MGCL]; (1 ♀) same data, PTERO1822 [MGCL]; (4 ♂) 2.vii.2019, PTERO1866 [CUIC], PTERO1933, 1935, 1936 [MGCL]; (1 ♀) same data, PTERO1825 [MGCL]; (6 ♂) same location, 3.vii.2019, PTERO1869, 1932 [CUIC], PTERO1882, 1932, 1934, 1937, 1957 [MGCL]; (2 ♀) same data, PTERO1827, 1903 [MGCL]; (3 ♂) same location, 4.vii.2019, PTERO1883 [CUIC], PTERO1928, 1953 [MGCL]; (2 ♂) 6.vii.2019, PTERO1900, 1924 [MGCL]; (3 ♂) 7.vii.2019, PTERO1926 [CUIC], PTERO1923, 1925 [MGCL]; (4 ♂) 8.vii.2019, PTERO1878, 1881 [CUIC], PTERO1879, 1922 [USNM]; (1 ♂) 9.vii.2019, PTERO1913 [MGCL]; (2 ♂) 10.vii.2019, PTERO1915, 1918 [MGCL]; (2 ♂) 11.vii.2019, PTERO1846 [CUIC], PTERO1917 [USNM]; (♂) 12.vii.2019, PTERO1914 [MGCL]; (1 ♂) 13.vii.2019, PTERO1919 [MGCL]; (2 ♂) 14.vii.2019, PTERO1847 [MGCL], PTERO1844 [USNM]; (1 ♂) 16.vii.2019, PTERO1862 [MGCL]; (1 ♀) 27.vii.2019, PTERO1909 [MGCL]; (1 ♂) 1.viii.2019, PTERO1865 [MGCL]; (1 ♂) 41.2018°, -71.5775°, 24.vii.2019, PTERO1863 [CUIC]; (2 ♂) 41.2062°, -71.5583°, 17.vi.2019, PTERO1875 [CUIC], PTERO1871 [MGCL]; (1 ♀) same

data, PTERO1821 [MGCL]; (2 ♂) 41.207°, -71.599°, 17.vi.2019, PTERO1877 [CUIC], PTERO1872 [MGCL]; (1 ♂) 41.207°, -71.560°, 17.vi.2019, PTERO1873 [MGCL], (1 ♂) 41.208°, -71.561°, 17.vi.2019, PTERO1927 [MGCL]; (1 ♂) 41.2080°, -71.5607°, 5.vii.2019, PTERO1921 [MGCL]; (1 ♀) 41.2085°, -71.5620°, 31.vii.2018, PTERO1824 [MGCL]; (2 ♀) 41.2156°, -71.5603°, 14.vii.2018, PTERO1820, 1908 [MGCL]; (4 ♂) 41.223°, -71.563°, 9.vi.2019, PTERO1885–1887 [MGCL], PTERO1884 [USNM]; (1 ♂) 41.226°, -71.572°, 7.vi.2019, PTERO1848 [CUIC].

Comments – The large sample size of this species gives us some insight into size variation. As noted above, wing expanse of Block Island specimens ranged from 18–31 mm, with several smaller specimens present. Cashatt (1972) reported 24–34 mm in his original description based on 51 specimens. While insular dwarfism has been noted in the case of segregate populations of *Dejongia californicus* (Walsingham) in the Bahamas (Matthews et al. 2019), this is likely not the case with *H. glenni*. *Hellinsia* stem borers can have a variable number of instars as found in *H. balanotes* by McFadyen (1972), allowing the compensatory response of fewer instars and hence different sized adults when suitable food quality and quantity are limited. Larvae are stem borers in *Solidago*, including *S. canadensis*, and *Symphotrichum* (*Aster*).

Distribution – In Canada, the species has been recorded in Quebec and Ontario. In the USA, it is common throughout the eastern part of the country, rare as far south as Florida, and extends into eastern Texas. In the west, it has been recorded from California, Washington, and Montana.

Emmelina monodactyla (Linnaeus) (Fig. 5)

Diagnosis – Wing expanse 21–25 mm. Forewing ground color variable shades of drab and gray; buff and reddish forms also present, especially in the western USA. Generally recognized by the elongate wing shape with curved first lobe extending beyond second lobe, small oblique mark at cleft base, and a distinct minute discal spot.

Specimens Examined – (1 ♀) 41.1615°, -71.6050°, 15.vii.2019, N.D.F. Grindley, PTERO1793 [MGCL]; same location, (1 ♂) 12.viii.2019, N.D.F. Grindley, PTERO1791 [USNM]; (1 ♀) 3.ix.2019, N.D.F. Grindley, PTERO1788 [MGCL]; (1 ♂) 41.1670°, -71.5730°, 27.vi.2019, PTERO1794 [MGCL]; (1 ♀) 41.1950°, -71.5652°, 2.vi.2019, PTERO1789 [MGCL]; (1 ♂) same location, 7.vi.2019, PTERO1802 [MGCL]; (1 ♀) 24.vi.2019, PTERO1790 [CUIC]; (1 ♀) 1.vii.2019, PTERO1792 [MGCL]; (1 adult, no abdomen) 2.vii.2019, PTERO1795 [MGCL]; (1 ♀) 3.vii.2019, PTERO1796 [USNM]; (1 ♂) 8.vii.2019, PTERO1785 [MGCL]; (1 ♀) 8.vii.2019, PTERO1786 [MGCL]; (1 ♀) 9.vii.2019, PTERO1787 [MGCL]; (1 ♀) 16.vii.2018, PTERO1801 [CUIC]; (2 ♀) 17.vii.2019, PTERO1797, 1798 [MGCL]; (1 ♀) 4.viii.2018, PTERO1800 [MGCL]; (1 ♀) 41.2080°, -71.5607°, 26.vii.2019, A.S. Hunt, N.D.F. Grindley, PTERO1799 [CUIC].

Comments – Larvae feed on various species of Convolvulaceae and are most commonly associated with hedgebindweed, *Calystegia sepium* (L.) R. Br. in the Nearctic Region.

Distribution – This widespread and common species has been recorded within the Nearctic, Palearctic, Neotropical, Ethiopian, and Oriental faunal regions.

Adaina ambrosiae (Murtfeldt)

Diagnosis – Wing expanse 16–18 mm. Forewing mottled gray consisting of scattered fuscous, drab, and white scales. Two fuscous to black costal dashes on first lobe usually darker than in *H. inquinatus* and more widely spaced. Best distinguished from *H. inquinatus* by markings on the abdomen: small middorsal fuscous spots along segments A2–A6 joined as single spots on midline as opposed to separate paired spots on *H. inquinatus*, and *A. ambrosiae* with fuscous lateral patches on abdominal segments A4 and A5. Hindwing uniform drab.

Specimens Examined—(1 ♂) 41.212°, -71.573°, 6.vi.2019, A.S. Hunt, N.D.F. Grindley, PTERO1774 [USNM]; same data (2 adults, abdomens missing) PTERO1775, 1778 [MGCL]; (1 ♂) PTERO1777 [MGCL]; (1 ♂) PTERO1776 [CUIC].

Comments – Larval hostplants which occur on the island are *Ambrosia artemisiifolia* L., and *Rudbeckia hirta* L.

Distribution – This species is widespread across the USA and the West Indies and has been recorded in Ontario, Canada.

Discussion

Plume moths compose a small but highly visible portion of Block Island's moth diversity. Currently, 1,056 species of moths are known from the island; the 14 species of plume moths documented in this survey comprise about 1.3% of this total. The commonest plume moth species found in this survey, *Hellinsia glenni*, was found at all survey sites visited in 2019 during its peak flight period from mid-June through early July and was among the ten most abundant moth species recorded at the main survey site (the Hunt property) during nightly observations (1 June to 16 August) in summer 2019 (Aaron Hunt, unpublished data).

Block Island's history of clear cutting for agriculture and wood has left it with a paucity of native tree species and a landscape dominated by brushland, cherry woods, and fields. The Hunt property is well removed from any substantial wooded areas and surrounded mostly by brushland dominated by bayberry (*Myrica pensylvanica* Mirbel) and beach rose (*Rosa rugosa* Thunb.), with small grassy areas and dunes comprising the remainder of the local habitat. A patch of goldenrod (*Solidago* L.) and a large *Baccharis halimifolia* L. on the property explain the local abundance of *Hellinsia* borers.

Based on the documented flora of Block Island (Paton et al. 2002), the detection of additional species is anticipated as a broader sampling regime is employed. Among these, as noted above, is *Geina tenuidactylus*, which feeds on *Rubus* and is difficult to distinguish from *G. buscki*. In addition to *Geina periscelidactylus*, two other grape feeders, *G. shepardii*, and *Sphenarches ontario* (McDunnough) are also likely species to occur there. Likewise, *Oidaematophorus eupatorii* (Fernald) and *Hellinsia elliottii* are also possible, with both feeding on Joe-Pye weeds *Eutrochium* Raf. (= *Eupatorium* L. in part). Though more commonly known from the southeastern USA, *Buckleria parvulus*, the sundew plume moth, should also be searched for based on the occurrence of *Drosera intermedia* Hayne and *D. rotundifolia* L. on the island.

Acknowledgments

We thank Nigel Grindley for his help with black lighting nights and collection of specimens and especially for his photographing many pinned moths to help with later association of identifications with live images. We also thank Charles E. Vandemoer (Project Leader / Refuge Manager for the Rhode Island National Wildlife Refuge Complex, U.S. Fish and Wildlife Service) for permitting use of Block Island National Wildlife Refuge lands, Rob and Kit Rohn for providing access to their property, and Kim Gaffett (TNC-BI) and Scott Comings for their help coordinating land use permitting for the Block Island moth survey and for their encouragement and aid with the project over the last several years. Finally, we thank Terry A. Lott for reviewing the text.

References

- Cashatt, E.D. 1972. Notes on the balanotes (Meyrick) group of *Oidaematophorus* Wallengren with description of a new species (Pterophoridae). *Journal of the Lepidopterists' Society* 26(1): 1–13.
- Gielis, C. 2003. Pterophoroidea & Alucitoidea - In: *World Catalogue of Insects* 4: 1–198.
- Gielis, C. 2006. Review of the Neotropical species of the family Pterophoridae, part I: Ochyroticinae, Deuterocopinae, Pterophorinae (Platyptiliini, Exelastini, Oxyptilini) (Lepidoptera). *Zool. Med. Leiden* 80-2(1): 1–290.
- McFadyen, P.J. 1972. Biological control of groundsel bush, *Baccharis halimifolia* (Linn.). MS Thesis, University of Queensland. 221 pp.
- Matthews, D.L. and T.A. Lott. 2005. Larval hostplants of the Pterophoridae (Lepidoptera: Pterophoroidea). *Memoirs of the American Entomological Institute* 76: 1–324.
- Paton, P.W., L.L. Gould, P.V. August, and A.O. Frost, (Eds.). 2002. *The Ecology of Block Island*. Proceedings of the Rhode Island Natural History Survey Conference, October 28, 2000. The Rhode Island Natural History Survey, Kingston, RI. 235p.
- Ridgway, R. 1912. *Color Standards and Color Nomenclature*. Washington, D. C., published by the author, 43p. + 53 color plates.
- USDA, NRCS. 2006. *The PLANTS Database*, 6 March 2006 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA. Last accessed, 16 March 2020.