

Specimen records for North American Lepidoptera (Insecta) in the Oregon State Arthropod Collection. Cossoidea: Cossidae Leach, 1815 and Sesiidae Boisduval, 1828

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Introduction

These records were generated using funds from the LepNet project (Seltmann et. al., 2017) - a national effort to create digital records for North American Lepidoptera. The dataset published herein contains the label data for all North American specimens of Cossidae and Sesiidae residing at the Oregon State Arthropod Collection as of March 2019. A *beta version* of these data records will be made available on the OSAC server (<http://osac.oregonstate.edu/IPT>) at the time of this publication. The beta version will be replaced in the near future with an official release (version 1.0), which will be archived as a supplemental file to this paper.

Methods

Basic digitization protocols and metadata standards can be found in (Shepard et al. 2018). Much of the newer material was identified by two specialists on Sesiidae: Mr. John Vernon and Mr. Benjamin G. Thompson. Identifications were reviewed by Jon Shepard and Paul Hammond using Barnes and McDunnough (1911) and the Digital Guide to Moth Identification (Moths Photographers Group, 2019). Nomenclature follows that of Hodges (1983) and the Moth Photographers Group (2019) and was checked again using the species matching tool produced by GBIF (<https://www.gbif.org/tools/species-lookup>).

Results

As of March 2019, the collection possessed 181 specimens of North American Cossidae, belonging to 8 known species classified into 6 genera: *Comadia* Barnes & McDunnough 1911, *Cossus* Fabricius 1793, *Givira* Walker 1856, *Prionoxystus* Grote 1882, *Toronia* Barnes & McDunnough 1911, and *Zeuzera* Latreille 1804 (Table 1)

The collection's holdings for Sesiidae are more extensive, including 1954 specimens, belonging to 82 distinct species, classified among 17 genera: *Albuna* Edwards 1881, *Alcathoe* Edwards, 1882, *Carmentis* Edwards 1881, *Euhagena* Edwards 1881, *Hymenoclea* Engelhardt, 1946, *Melittia* Hübner 1819, *Palmia* Beutenmüller, 1896, *Paranthrene* Strand, 1916, *Pennisetia* Dehne, 1850, *Penstemonia* Engelhardt,

1946, *Podosesia* Möschler, 1879, *Sannina* Walker, 1856, *Sesia* Fabricius 1775, *Sophona* Walker, 1856, *Synanthedon* Hübner, 1819, *Vitacea* Engelhardt, 1946, *Zenodoxus* Grote & Robinson, 1868 (Table 2).

Table 1. Species inventory of OSAC North American Cossidae

Taxon	# specimens
<i>Acosus centerensis</i> Lintner, 1877	4
<i>Acosus populi</i> (Walker, 1856)	65
<i>Comadia bertholdi</i> Grote, 1880	13
<i>Comadia henrici</i> Grote, 1882	1
<i>Comadia</i> undetermined	9
<i>Givira marga</i> Barnes & McDunnough, 1910	2
<i>Givira</i> undetermined	12
<i>Prionoxystus robiniae</i> Peck, 1818	69
<i>Toronia perplexa</i> (Neumogen & Dyar, 1893)	5
<i>Zeuzera pyrina</i> (Linnaeus, 1761)	1
	total
	181

Table 2. Species inventory of OSAC North American Sesiidae

Taxon	# specimens
<i>Albuna fraxini</i> Edwards, 1881	14
<i>Albuna pyramidalis</i> Walker, 1856	43
<i>Alcathoe autumnalis</i> Engelhardt, 1946	2
<i>Alcathoe carolinensis</i> Engelhardt, 1925	14
<i>Alcathoe caudata</i> Harris, 1839	11
<i>Alcathoe pepsoides</i> Engelhardt, 1925	2
<i>Alcathoe verrugo</i> (Druce, 1884)	1
<i>Carmenta bassiformis</i> Walker, 1856	11
<i>Carmenta corni</i> Edwards, 1881	11
<i>Carmenta engelhardti</i> Duckworth & Eichlin, 1973	3
<i>Carmenta giliae</i> Edwards, 1881	1
<i>Carmenta ithacae</i> Beutenmüller, 1897	3
<i>Carmenta mariona</i> (Beutenmüller, 1900)	1
<i>Carmenta mimuli</i> (Edwards, 1881)	39
<i>Carmenta prosopis</i> Edwards, 1882	3
<i>Carmenta pyralidiformis</i> Walker, 1856	17
<i>Carmenta tecta</i> Edwards, 1882	1
<i>Carmenta texana</i> Edwards, 1881	2

Table 2. (continued) Species inventory of OSAC North American Sesiidae

Taxon	# specimens
<i>Carmenta verecunda</i> Edwards, 1881	1
<i>Euhagena emphytiformis</i> (Walker, 1856)	3
<i>Euhagena nebraskae</i> Edwards, 1881	11
<i>Hymenoclea palmii</i> Beutenmüller, 1902	4
<i>Melittia calabaza</i> Duckworth & Eichlin, 1973	2
<i>Melittia cucurbitae</i> Harris, 1828	23
<i>Melittia gloriosa</i> Edwards, 1880	25
<i>Melittia grandis</i> Strecker, 1881	4
<i>Melittia snowii</i> Edwards, 1882	33
<i>Palmia praecedens</i> Edwards, 1883	1
<i>Paranthrene asilipennis</i> Boisduval, 1829	17
<i>Paranthrene dollii</i> Neumoegen, 1894	7
<i>Paranthrene pellucida</i> Greenfield & Karandinos, 1979	4
<i>Paranthrene robiniae</i> (Edwards, 1880)	51
<i>Paranthrene simulans</i> Grote, 1881	45
<i>Paranthrene tabaniformis</i> (Rottemburg, 1775)	16
<i>Pennisetia marginatum</i> (Harris, 1839)	8
<i>Penstemonia clarkei</i> Engelhardt, 1946	16
<i>Penstemonia pappi</i> Eichlin, 1987	6
<i>Podosesia aureocincta</i> Purrington & Nielsen, 1977	13
<i>Podosesia syringae</i> Harris, 1839	90
<i>Sannina uroceriformis</i> Walker, 1856	5
<i>Sesia apiformis</i> (Clerck, 1759)	3
<i>Sesia spartani</i> Eichlin & Taft, 1988	3
<i>Sesia tibiale</i> (Harris, 1839)	140
<i>Sophona snellingi</i> Eichlin, 1986	1
<i>Synanthedon acerni</i> (Clemens, 1860)	15
<i>Synanthedon acerrubri</i> Engelhardt	22
<i>Synanthedon albicornis</i> (Edwards, 1881)	48
<i>Synanthedon arizonensis</i> Beutenmüller, 1916	1
<i>Synanthedon bibionipennis</i> Boisduval, 1869	277
<i>Synanthedon castanae</i> Busck, 1913	4
<i>Synanthedon chrysidipennis</i> Boisduval, 1869	56
<i>Synanthedon culiciformis</i> (Linnaeus, 1758)	5
<i>Synanthedon decipiens</i> Edwards, 1881	4
<i>Synanthedon exitiosa</i> Say, 1823	168

Table 2. (continued) Species inventory of OSAC North American Sesiidae

Taxon	# specimens
<i>Synanthedon fatifera</i> Hodges, 1963	1
<i>Synanthedon fulvipes</i> (Harris, 1839)	10
<i>Synanthedon geliformis</i> (Walker, 1856)	1
<i>Synanthedon helenis</i> Druce, 1889	12
<i>Synanthedon kathyae</i> Duckworth & Eichlin, 1977	1
<i>Synanthedon mellinipennis</i> Boisduval, 1836	20
<i>Synanthedon novaroensis</i> (Edwards, 1881)	66
<i>Synanthedon pictipes</i> Grote & Robinson, 1868	30
<i>Synanthedon polygona</i> Edwards, 1881	16
<i>Synanthedon proxima</i> (Edwards, 1881)	9
<i>Synanthedon pyri</i> (Harris, 1830)	7
<i>Synanthedon resplendens</i> Edwards, 1881	232
<i>Synanthedon rhododendri</i> Beutenmüller, 1909	7
<i>Synanthedon rileyana</i> Edwards, 1881	17
<i>Synanthedon sapygaeformis</i> Walker, 1856	2
<i>Synanthedon saxifragae</i> Edwards, 1881	2
<i>Synanthedon scitula</i> (Harris, 1839)	9
<i>Synanthedon sequoiae</i> (Edwards, 1881)	125
<i>Synanthedon sigmoidea</i> (Beutenmüller, 1897)	10
<i>Synanthedon tipuliformis</i> (Clerck, 1759)	8
<i>Vitacea admiranda</i> (Edwards, 1882)	1
<i>Vitacea cupressi</i> (Edwards, 1881)	1
<i>Vitacea polistiformis</i> (Harris, 1854)	29
<i>Vitacea scepiformis</i> (Edwards, 1881)	8
<i>Zenodoxus heucherae</i> Edwards, 1881	1
<i>Zenodoxus palmii</i> Neumoegen, 1891	1
<i>Zenodoxus rubens</i> Engelhardt, 1946	6
<i>Zenodoxus sidalceae</i> Engelhardt, 1946	4

Additional material from outside of North America is present, but was not digitized and catalogued at this time.

Label data for these specimens can be accessed via online data portals that serve osac IPT data (e.g., www.gbif.org) or by direct download via the archived datasets stored in the supplemental files of this paper.

Discussion:

In the Pacific Northwest, Cossidae are most common and diverse east of the Cascade Mountains in association with their larval food plants that include aspen and willow in riparian habitats. However, one California species, *Toronia perplexa*, can be found uncommonly in coniferous forests along the west slope of the Cascade Range. Currently the OSAC's holdings of *T. perplexa* amount to but 5 specimens, 4 of which were taken at the H. J. Andrews Experimental Forest near Blue River, Oregon. More surveys of the western Cascades during their flight season could significantly expand the known range of this species in Oregon.

OSAC's holdings of North American Sesiidae are more comprehensive, including nearly 60% of the currently known North American fauna (Moths Photographers Group 2019; Hodges 1983). This is largely the result of material placed into the collection by Benjamin Garrison Thompson, who wrote his dissertation at Oregon State Agricultural College on clearwing moths (Thompson 1929) as well as Mr. John Vernon, an outstanding sesiid enthusiast who gave his collection to the university in 2008.

Minor corrections and other small modifications made in the future to this dataset will be accomplished by issuing a new version and providing a file of modified records to the supplemental files. Major additions, such as new records, new data fields, new contributors or other significant modifications will be accomplished through the generation and release of new datasets.

Acknowledgments

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