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The Hawthorn Moth *Scythropia crataegella* (Lepidoptera: Yponomeutidae) in Mariehamn, Åland Islands, in 2010–2018

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The Hawthorn Moth *Scythropia crataegella* (Linnæus, 1767), an ermine moth of the family Yponomeutidae, is protected and declared as a species with strict protection according to the nature conservancy law of the Åland Islands. The species was found in 26 localities in the town of Mariehamn between 2010 and 2018. The only food plant of *S. crataegella* in the Åland Islands, previous to the studies of the author, was *Malus sylvestris*. The food plants of the larvae of *S. crataegella* in Mariehamn have been shrubs of four cultivated *Cotoneaster* species (taxa) and shrubs and saplings of two cultivated and one or two domestic *Crataegus* species. Of these, *Cotoneaster lucidus* (11 localities) and *C. horizontalis* (5 localities) are the most common food plants. Of these, *Cotoneaster lucidus* and *Crataegus grayana* are very common as cultivated hedge shrubs in Mariehamn. *Crataegus grayana*, has however, been found as a food plant in one locality only.

The exposition of the food plants seems to have some influence on the location of the infestations with the most common exposition towards the east (ten localities). West and south expositions have been observed in eight and five localities, respectively.

As the bulk of the localities are in cultivated hedges or shrubs of the food plants, the shearing of the hedges hampers the life of *S. crataegella*. Although *S. crataegella* is a protected species in the Åland Islands, it can be a garden pest. It is therefore understandable, but not recommended, if owners of hedges are cutting damaged parts of the shrubs.

As a bivoltine species, *C. crataegella* have been found regularly as generation I in June – July and again as generation II in August – September, always on the same shrub. However, some irregularities have been observed. In one locality nothing was seen of generation I on June 18, 2018, but four small silk webs with fairly small larvae of generation II were observed on August 14, 2018. In another locality, a small silk web with a few larvae and pupae of generation I was observed on June 21, 2016, but nothing of *S. crataegella* could be found in August the same year. However, a small silk web with a few larvae and pupae of generation I was observed on June 24, 2017. Possibly, all eggs do not hatch at the same time; some of them can perhaps survive till the next year.

The studies of *S. crataegella* in 2010–2018 show that the species is fairly common in Mariehamn. If all streets and gardens should be searched for *S. crataegella* infestations, the number of localities could most probably be considerably increased.

Introduction

The Hawthorn Moth *Scythropia crataegella* (Linnæus, 1767) is an ermine moth of the family Yponomeutidae (Fig. 1). It was protected by law in the Åland Islands in 1986 (ÅFS1986) and it was also declared as a species with strict protection according to the nature conservancy law

of the Åland Islands in 1998 (ÅFS 1998). It is regarded as endangered in Finland, according to the Red List of 2010 (Kaitila et al. 2010) and Red List of 2019 (Nupponen et al. 2019).

The author observed silk webs with larvae on a cultivated *Cotoneaster nanshan* shrub in June, 2010 (the nomenclature of the food plants is according to Hämet-Ahti et al. 1992). The location is at the street Södragatan 28 in the town of Mariehamn, Åland Islands, SW Finland. Later in the summer, new webs occurred on the same shrub and in late August some moths were observed. Then the species was recognised as *Scythropia crataegella*.

Nine more localities with infestations of *S. crataegella*, mainly on cultivated *Cotoneaster* shrubs, were found in Mariehamn in 2011–2012 and a report of these finds was published (Hæggström 2013).

Scythropia crataegella in Mariehamn 2010–2018

The locality at Södragatan 28 was studied yearly and new localities were searched for. The localities are treated below in that order they have been found. All localities were not studied during the whole season or during each year. Often observations were made at the time of either the first or the second generation only. The coordinates are given with 10 m accuracy, according to the plane coordinate system ETRS-TM35FIN (Ollikainen & Ollikainen 2004). The food plants are shrubs or saplings of either the genera *Cotoneaster* or *Crataegus*. The first and second generation is abbreviated I respectively II.

Locality 1. A *Cotoneaster nanshan* shrub with E exposition, at the E wall of the building at the street Södragatan 28 (668309:810743).

2010 Silk webs were observed on two parts of the shrub with larvae I in June and again with larvae, pupae and moths II in August.

2011 A strong infestation with silk webs on two parts of the shrub with larvae, pupae and moths I observed in May – June, and larvae, pupae and moths II observed in July – August. The first moths II hatched on c. August 20 and on August 27 hundreds of moths and many unhatched pupae were observed. About ten moths II were still to be seen in the silk web on September 18.

Fig. 1. An adult *Scythropia crataegella* moth of generation I on an undamaged branch of *Cotoneaster nanshan* in locality 1. The lenght of the moth is less than one cm. – Åland Islands, Mariehamn, Södragatan 28, June 25, 2018. All photos by the author.

2012 A very strong infestation with silk webs on almost the whole shrub with larvae I was observed on June 11. The pupation began about June 18 and the first hatched moths I were observed on July 3, some moths mating the following day. Dozens of moths were swarming on July 13 after sunset. Larvae and pupae II were observed in August.

2013 The population seem to have crashed as only one very weak infestation was observed with larvae I on June 8, and the first hatched moths I on July 4. Observations of generation II are lacking.

2014 About ten small silk webs were observed in late May with larvae I in June. One moth I observed on July 10. Observations of gen II are lacking.

2015 Only one small silk web was observed in early June. Other observations are lacking.

2016 Many small silk webs were observed along the whole shrub on June 8. The first moths I were observed on July 1, with a pair of moths mating, and several moths were swarming around the shrub at ten p.m. on July 8. New infestations occurred in late July with small silk webs on August 3, when the larvae II were 1–2 mm long. The development of the larvae seems to have ceased after that.
2017 One large and one small silk web with large larvae and pupae I was observed on June 26. Other observations are lacking.
2018 A few small silk webs were observed on the northern part of the shrub on May 20. Several pupae I were observed on June 12 and the first moths I were observed on June 19, one moth I was still alive on July 9. Almost the whole shrub was covered with silk in July – August with larvae and pupae II on August 8. The first moths II were observed on August 12 when dozens of them had emerged. Hundreds of moths occurred in the silk web by August 16. Dozens of dead moths were seen in the web on September 23.

Locality 2. ÅSS (Yacht Club) Marina restaurant, a small *Cotoneaster nanshan* shrub with S exposition in a larger *Buxus sempervirens* hedge at the street (668352:810702) and a small *Cotoneaster horizontalis* with W exposition at the quay (668351: 810701).
2010 Small silk webs were seen on both shrubs in July.
2011 A weak infestation on the *Cotoneaster nanshan* shrub was observed in June. The shrub died later that year. A silk web was observed on the *Cotoneaster horizontalis* shrub in June but no infestation was to be seen on August 28. No infestation of *S. crataegella* was observed since.

Locality 3. A *Cotoneaster nanshan* shrub with E exposition on the E side of the house at the street Högbackagatan 10 (668593:810867).
2010–2013 A weak infestation was observed in June 2010 and 2011, but nothing in August in those years. However, a weak infestation was observed both in June and August 2012. A weak infestation was observed again in 2013; unfortunately, the date was not recorded.
2014–2015 Observations are lacking.
2016 An infestation of generation I was observed.
2017 Observations are lacking.
2018 No infestation in August.

Locality 4. A rather small shrub of *Cotoneaster nanshan* with S exposition, growing on the lawn near the NE end of the alley Mek-Mattesgränd (668285:810752).
2011 Weak infestations on the S part of the shrub with larvae I were observed on June 25. A few pupae and moths II were observed on August 25.
2012–2013 The infestation was weak both in June and in August.
2014–2015 No infestation was observed on June 9, 2014. No further observations during 2014 and 2015.
2016 A small silk web with pupae I were observed on July 5. No further observations.
2017 Two small silk webs with pupae I were observed on June 25. No further observations.
2018 No infestation was observed on June 18. Four small silk webs with fairly small larvae II were observed on August 14.

Locality 5. A *Cotoneaster horizontalis* shrub with N exposition, growing between the house and the pavement of the street Köpmansgatan 5 (668364:810797).
2011 A weak infestation with a few pupae I hanging in the silk web was observed on June 27. The second generation was poor in individuals with only a few larvae and pupae observed on August 25. The reason was that the previously infested branches had been cut off the shrub.
2012 Seven or eight separate small silk webs with a few larvae I were observed on June 20. About ten larger silk webs with larvae II were observed on August 22.
2013 Seven or eight separate small silk webs with a few larvae I were observed on June 20. Two recently hatched moths I were seen on July 4. No further observations.
2014 About ten separate small silk webs with a few small larvae I were observed on June 20. No further observations.

2015 About ten separate small silk webs with a few larvae I were observed on June 23. No further observations.
2016 About ten small silk webs with mining larvae I were observed on June 8. Several moths I were observed on July 9. Mining larvae II and small silk webs were observed on August 2. The larvae II developed to about 1–2 mm length but after that they did not grow.
2017 The whole shrub was covered with silk webs I on June 23. No further observations.
2018 The *Cotoneaaster horizontalis* shrub had many dead branches on May 21. The dead branches were later cut. No infestation could be observed on July 12, July 26, August 16 or September 24.

Locality 6. A 1-m-high *Crataegus monogyna* or *rhipidophylla* sapling exposed in all directions at the street Sjöpromenaden, next to the stern of the four-masted barque Pommern (668336:810707).
2011 A fairly strong infestation with a few larvae and pupae II was observed on August 27. Other larger hawthorn trees in the vicinity were not infested. The sapling had been cut by 2012.

Locality 7. A hedge of *Cotoneaster lucidus* with E exposition at the street Badhusgatan 24 (668354:810729).
2011 A weak infestation with larvae and pupae II was observed on August 27. Probable infestations, twigs without leaves and dead damaged leaves without *S. crataegella* were observed on some parts of the hedge. These may have been infestations of the first generation. They were probably destroyed due to shearing of the hedge. – Long hedges of *Cotoneaster lucidus* of different height, from about 50 cm to 1.5 m or more, grow along both sides of the street Badhusgatan. However, no infestation of *S. crataegella* has been observed since 2011.

Locality 8. A hedge of *Cotoneaster lucidus* with S exposition at the street Norragatan 28 (668340: 810747).
2011 Several weak infestations with a few larvae and pupae II were observed on August 27. The hedge was sheared earlier in the summer.
2012 A few weak infestations with a few pupae I were observed July 4. Nothing of *S. crataegella* could be found in August 2012, probably because of thorough shearing of the hedge. – No infestation of *S. crataegella* was observed since.

Locality 9. A hedge of *Cotoneaster lucidus* with SW exposition at the street Skarpansvägen 19 (668398:810790).
2011 Several weak infestations with a few moths II were observed on August 27. The hedge was sheared earlier in the summer.
2012 Nothing of *S. crataegella* could be found on June 20, or August 22.
2012–**2015** No observations.
2016 A small silk web with a few larvae and pupae I was observed on June 21. Nothing of *S. crataegella* could be found in August.
2017 A small silk web with a few larvae and pupae I was observed on June 24. No further observations.
2018 A few small silk webs with pupae I and one recently hatched moth I were observed on June 14. Old silk webs were observed on June 26. A few small silk webs with pupae II were observed on August 10.

Locality 10. A *Cotoneaster lucidus* hedge with W exposition at the street Hamngatan, E of the old customs building (668313-668315:810715).
2012 Dozens of swarming moths I were observed in sunshine just before the sunset along a 20–30-metre-long stretch on July 17. No further observations.
2013 Weak infestations along 20–30 m of the hedge on June 23. No further observations.
2014 No infestation could be observed on June 20. No further observations later in the summer.
2015 No observations.
2016 A large silk web on the southernmost part of the hedge with pupae I were observed on June 25. (The infestations in 2012–2013 were located about 20 metres farther north.) A few dead moths I were observed on July 2. No sign of infestations could be observed in August or September.

2017 A large silk web on the southernmost part of the hedge with pupae I was observed on June 24. No further observations.
2018 Several small silk webs on May 20. No sign of infestations on June 23, July 11, July 31 or August 12.

Locality 11. An about 5-m-long shrub of *Cotoneaster dammeri* var. *radicans* with E exposition at the office of the Viking Line, between the streets Norragatan and Nygatan (668342:810794).
2014 Several silk webs with a few pupae I were observed on June 26. No sign of *S. crataegella* could be seen on July 24. No further observations.
2015 Several strong infestations with fairly small larvae I were observed on June 25. No further observations.
2016 A few mines and silk webs I were observed on June 8. A few moths I were observed on July 9. Silk webs with larvae II were observed in late August and early September, but after reaching a length of 1–2 mm the larvae did not develop further.
2017 A considerable part of the shrub was covered by silk webs on June 23. A few larvae and pupae I were observed. No further observations.
2018 No infestation could be found on several occasions between May 21 and September 24.

Locality 12. A hedge of *Crataegus laevigata* with interspersed shoots of *C. grayana* with S exposition at the street Skeppargatan 10 (668388: 810783-810784).
2014 Strong infestation with *Crataegus laevigata* eaten and pupae I observed on June 26. One moth I observed on July 24. No further observations. – The interspersed shoots of *C. grayana* were not eaten and the adjacent hedge of *C. grayana* was intact, too.
2015 Strong infestations with *Crataegus laevigata* eaten with weak signs of *C. grayana* also eaten. Large larvae and many pupae I observed on June 25. No further observations.
2016 Dozens of silk webs with large larvae and many pupae I observed on June 13. A few dead moths I observed on July 7. Rather weak infestation with one pupa II observed on September 19.
2017 A few small silk webs with a few large larvae and some pupae I observed on June 24. The hedge was sheared. No further observations.
2018 A few small silk webs in the W part of the hedge and three large silk webs in the E part with numerous pupae I on June 14. Both *Crataegus laevigata* and *C. grayana* were eaten. Many moths I observed on June 26. Strong infestation with both shrub species eaten on August 8, when larvae and a few pupae II were observed (Fig. 2).

Locality 13. A 1.5-m-high sapling of *Crataegus rhipidophylla* with W exposition, growing on a terrace on the slope E of the ÅSS (Yacht Club) Marina restaurant (668351:810703).
2016 A few silk webs with larvae and pupae I were observed on June 25. No infestations on the sapling since.

Locality 14. A shrub of *Cotoneaster horizontalis* with chiefly E exposition in Erikson's garden at the corner of the streets Ålandsvägen – Norra Esplanadgatan (668328-668329:810776).
2018 A few silk webs with larvae II were observed on August 5 (Fig. 3); a few more empty silk webs were observed on September 24.

Locality 15. A hedge of *Cotoneaster lucidus* with E exposition in Östra Ytternäs, on the W side of the street Östernäsvägen (668107:810855).
2018 Silk webs were observed on a distance of 5–6 metres in the hedge with some larvae II on August 7.

Locality 16. A small shrub of *Cotoneaster horizontalis* with E exposition in Östra Ytternäs, on the E side of the house at the street Granvägen 50 (668135:810852).
2018 A few silk webs with young larvae II were observed on August 7.

Locality 17. A small shrub of *Cotoneaster horizontalis* with W exposition in Östra Ytternäs S of the house at the street Granvägen 7 (668180: 810850).
2018 A few thin silk webs with few small larvae II were observed on August 7.

Fig. 2. A part of the *Crataegus laevigata* hedge with interspersed *C. grayana* in locality 12 is partly destroyed and covered with silk webs by the larvae II of *Scythropia crataegella*. – Åland Islands, Mariehamn, Skeppargatan 10, August 10, 2018.

Fig. 3. A rather small silk web with a few larvae II of *Scythropia crataegella* on a *Cotoneaster horizontalis* shrub in locality 14. – Åland Islands, Mariehamn, Erikson's garden at the corner of the streets Ålandsvägen – Norra Esplanadgatan, August 6, 2018.

Locality 18. A *Cotoneaster lucidus* hedge with SW exposition at the street Hantverkargatan about 40–50 m southeast of the street Öhbergsvägen (668255:810809).
2018 One small silk web with five large larvae and five pupae II observed on August 7.

Locality 19. A 2.5-m-long shrub of *Cotoneaster horizontalis* with E exposition between the house and the street Neptunigatan 34 (668333:810736).
2018 Almost the whole shrub was covered with silk webs with several larvae and pupae II on August 9.

Locality 20. A *Cotoneaster lucidus* hedge with S exposition in Hindersböle at the NW corner of the streets Lillåkersvägen and Ljungvägen (668605: 810875).
2018 Two small silk webs with larvae II were observed on August 16.

Locality 21. A *Cotoneaster lucidus* hedge with W exposition in Hindersböle at the street Ljungvägen 3 (668602-668604:810877).
2018 Three small silk webs were observed in the hedge in front of the house and further one silk web at the SW corner, with larvae II in both places on August 16.

Locality 22. A *Crataegus laevigata* hedge with W exposition in Hindersböle at the street Ljungvägen 9 (668598:810877).
2018 A few small silk webs, the majority of them near the ground sheltered by grasses and weeds, were observed with larvae II on August 16.

Locality 23. A *Cotoneaster lucidus* hedge with W exposition in Hindersböle at the street Solvändan 21 (668575:810885).
2018 Two silk webs with a few pupae II were observed on August 16.

Locality 24. A *Cotoneaster lucidus* hedge with W exposition in Hindersböle at the street Blomstervägen 19 (668569-668570:810889).
2018 Three small silk webs without any larvae or pupae in front of the house and two small silk webs with a few pupae II about 10 m further S were observed on August 16.

Locality 25. The long *Cotoneaster lucidus* hedge with E exposition between the main street Östra utfarten and the main building of the Local Government of Åland (668327:810819).
2018 Two small silk webs with a few larvae II were observed on August 16.

Locality 26. A *Crataegus laevigata* hedge with E exposition at the N end of the street Hamngatan (668335:810713).
2018 A few small silk webs with larvae II were observed on August 16.

Discussion

The only food plant of *S. crataegella* in the Åland Islands, previous to the studies of the author, was *Malus sylvestris* (cf. Hæggström 2013). The food plants of the larvae of *S. crataegella* in Mariehamn have been shrubs of *Cotoneaster* and shrubs and saplings of *Crataegus*. Larvae have been found feeding on the following taxa:
Cotoneaster dammeri var. *radicans* – 1 locality
C. horizontalis – 5 localities
C. lucidus – 11 localities
C. nanshan – 4 localities
Crataegus grayana – 1 locality
C. laevigata – 3 localities
C. monogyna or *rhipidophylla* – 1 locality
C. rhipidophylla – 1 locality

Of these, *Cotoneaster lucidus* and *Crataegus grayana* are very common as cultivated hedge shrubs in Mariehamn. They have been found also as garden escapes (Hæggström & Hæggström 2010). *Cotoneaster dammeri* var. *radicans* is rarely cultivated and the only shrub seen by the author is that in locality 11. *C. horizontalis* and *C. nanshan* are more frequently cultivated in gardens. The domestic species *Cotoneaster integerrimus* is rather rare in the Åland Islands (Hæggström & Hæggström 2010); *S. crataegella* has not been found on this species.

Crataegus laevigata is fairly common as a cultivated species in Mariehamn, especially as the tree cultivar 'Pauls Scarlet'. *C. monogyna* and *C. rhipidophylla* are domestic tree species. Of these, *C. monogyna* is rare and *C. rhipidophylla* rather rare in the Åland Islands (Hæggström & Hæggström 2010).

Fig. 4. The *Cotoneaster nanshan* shrub in locality 1 is almost totally covered with webs of *Scythropia crataegella*. As the shrub is eaten twice a year by the moth larvae, it will suffer – the moth can be a real garden pest. – Åland Islands, Mariehamn, Södragatan 28, June 25, 2018.

The exposition seems to have some influence on the location of the infestations. The most common exposition is towards the east with ten localities observed. The second and third places are held by west and south expositions, with eight and five localities, respectively. Two localities are towards the southwest, whereas only one is towards the north. One locality has an exposition in all directions.

As the bulk of the localities are cultivated hedges or shrubs of the food plants, the shearing of the hedges hampers the life of *S. crataegella*. It may be difficult to find *S. crataegella* in some hedges as they are sheared every year and some house owners are more thorough in their shearing, removing every damaged part of the hedge or shrub. In some of the localities, e.g. nos. 7 and 8, the yearly shearing of the *Cotoneaster lucidus* hedges may have destroyed the infested parts of the hedges, as no infestation could later be seen. Thorough cutting of infested branches have also occurred frequently in the *Cotoneaster horizontali*s shrub in locality no. 5. In locality no. 6 the *Crataegus* sapling was cut.

Although *S. crataegella* is a protected species in the Åland Islands, it can be a garden pest (Fig. 4). It is therefore understandable if owners of hedges are cutting damaged parts of the shrubs. The inhabitants of the houses at localities 1 and 12 have been informed by the author about *S. crataegella* and its status as a protected moth. The hedge of *Cotoneaster nanshan* in locality 1 has been left more or less intact during all years of observation. The hedge of *Crataegus laevigata* with interspersed shoots of *Crataegus grayana* in locality 12 has been sheared every year, but the house owners have left some parts with silk webs of *S. crataegella* without shearing the hedge too thoroughly.

As a bivoltine species, *C. crataegella* has been found regularly as generation I in June – July and again as generation II in August – September, always on the same shrub. However, some irregularities have been observed. In locality no. 4, nothing was seen of generation I on June 18, 2018, but four small silk webs with fairly small larvae II were observed on August 14, 2018. In locality no. 9, a small silk web with a few larvae I and pupae I was observed on June 21, 2016, but nothing of *S. crataegella* could be found in August the same year. However, a small silk web with a few larvae I and pupae I was observed on

June 24, 2017. Possibly, all eggs do not hatch at the same time; some of them can perhaps survive till the next year.

S. crataegella was supposed to be fairly common in Mariehamn (Hæggström 2013). The studies during the years after 2012, and especially during 2018, show that the species is still fairly common. If all streets and gardens should be searched for *S. crataegella* infestations, the number of localities could most probably be considerably increased.

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