

Bulletin of the Oregon Entomological Society

Different Feeding Preferences

text and photos by Ron Lyons

Larvae of an unidentified sawfly (Hymenoptera: Tenthredinidae) were found feeding on willow leaves near Bandon, Oregon.

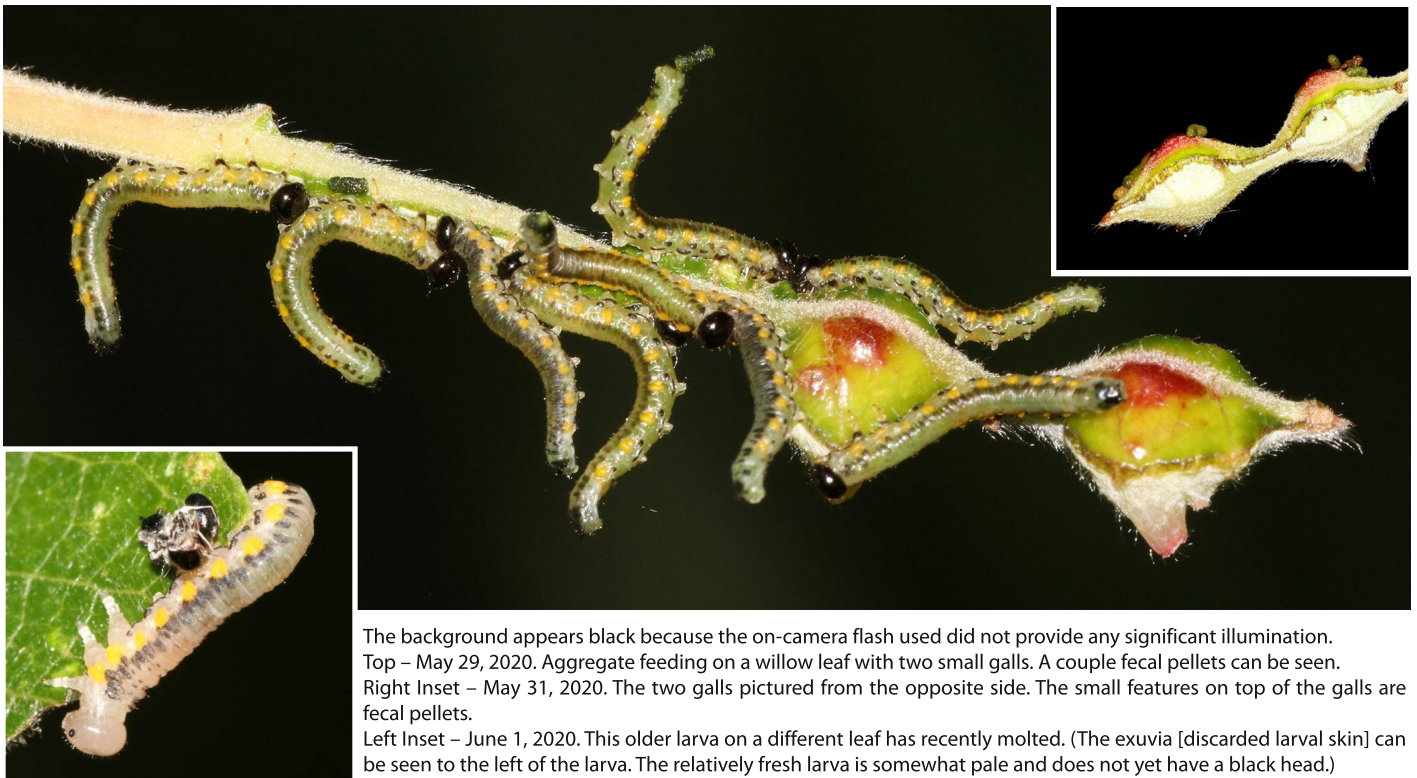
In the larger picture the larvae have almost finished eating the leaf they are on. However, the tissue associated with two small integral leaf galls along the midrib of the leaf was not eaten and the galls remained attached when the larvae moved to another leaf. By mid-June, the gall nearest the tip of the former leaf was still alive while the other one had dried up. Eventually the denuded leaf came off.

I suspect that each gall is the home of a single dipteran gall-maker. Russo's (2006) guide contains numerous pictures of galls on various plants. Similar galls on willow are shown for two

unidentified dipteran species of *Iteomyia*, but they are not similar enough to call them a reasonable match. (One of these *Iteomyia* species [Willow Tooth Gall Midge] induces a heavier gall with a more substantial tooth. Galls similar to these are present on nearby leaves.) The galls left behind appear more delicate and the tooth is just a little reddish bump on the bottom of the gall.

Reference

Russo, R. 2006. Field Guide to Plant Galls of California and other Western States. University of California Press, Los Angeles, California. 397 p.



The background appears black because the on-camera flash used did not provide any significant illumination.
Top – May 29, 2020. Aggregate feeding on a willow leaf with two small galls. A couple fecal pellets can be seen.
Right Inset – May 31, 2020. The two galls pictured from the opposite side. The small features on top of the galls are fecal pellets.
Left Inset – June 1, 2020. This older larva on a different leaf has recently molted. (The exuvia [discarded larval skin] can be seen to the left of the larva. The relatively fresh larva is somewhat pale and does not yet have a black head.)

Offense 0: Defense 1 [Hymenoptera vs Lepidoptera]

text and photos by Ron Lyons

At the 2016 Northwest Lepidopterists' Workshop, I gave a brief report on the movements of a chrysalis of a Lorquin's Admiral (Lepidoptera: Nymphalidae: *Limenitis lorquini*) over a period of days. The chrysalis was present in a small patch of *Spiraea douglassii* at my home near Bandon, in Coos County, Oregon (Lyons 2016). This year I was fortunate to find another chrysalis in the same area, and was able to study its behavior more extensively.

In order to study the motion, I made a number of videos with my Canon® 80D digital camera. For still pictures, the camera frame size is 6000x4000 pixels. The video function uses the central portion of the camera's detector and was set to produce a frame size of 1920x1080 pixels. The frame rate for the video was set at 30 frames per second, so the exposure midpoints of successive frames are separated by a time interval of ~0.03 seconds. (I do not know the exposure time for each frame—either it was not recorded or it was not accessible with my software.) A 4GB video clip covered activity for about 17 minutes and 44 seconds.

The physical area represented by each frame can be determined using the size of the chrysalis for scale. Because of its location in the middle of the *Spiraea* patch, the actual size of the chrysalis was not measured. James and Nunnallee (2011: p. 316) indicated that the Lorquin's Admiral chrysalis they illustrated was 23 mm long, just short of 1". Using their number for the length, the frame is about 3.0" x 1.7" at the distance of the chrysalis. (This is an estimate—it could be a bit bigger, it could be a bit smaller—but it gives you an idea of the area covered in the frames below.)

Observations

The Lorquin's Admiral adult emerged May 28, 2020, with the main emergence action taking place after 11:32 am. The next images I have, taken at 12:53 pm, show the newly emerged adult hanging with its wings fully expanded on the side of the now-empty chrysalis. The adult left on its maiden flight a few minutes later. Up until 11:32 at least, the outward appearance of the chrysalis (other than orientation changes) did not appear to change.

During a review of the video clip shot between 9:55:23 and 10:13:07 in the morning, I noticed an interesting but very short-lived encounter involving a yellowjacket (Hymenoptera: Vespidae) which is discussed below. The images presented are frames extracted from this video clip using Adobe® Premier® Elements 10 and are numbered from the first appearance of the yellowjacket in the frame. Not all frames are shown.

In general, the chrysalis would hang more or less vertically overnight. In the morning, the developing butterfly would curl so that the head of the chrysalis was oriented towards the south. On the morning of May 28, this transition was completed by ~9:20 am; at 9:55:23 am, the beginning of the next video clip, the

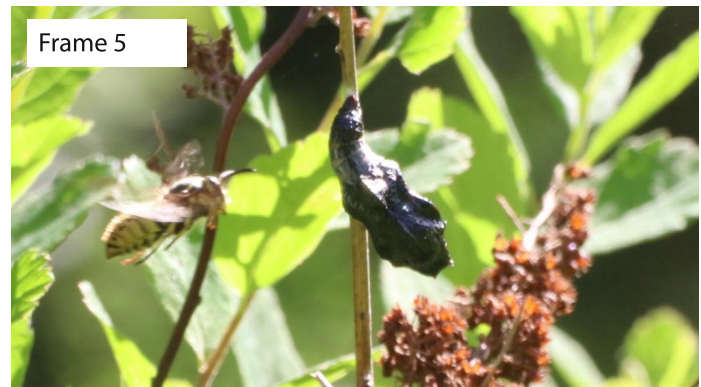
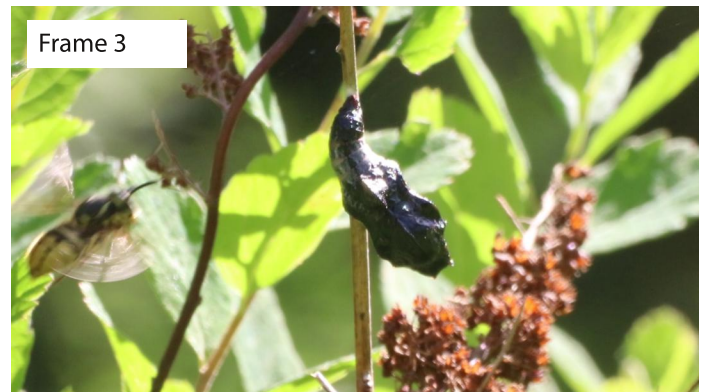
developing butterfly was holding steady in this position. (The exact timing of the transition was not the same every day, but may depend on local environmental conditions and/or other factors.) Usually at some point in the afternoon, the developing butterfly would swing so that its head was oriented towards the north. For obvious reasons this did not happen on May 28. Occasionally other changes in orientation were interspersed.

So, at 9:55 am, the developing butterfly was holding a position with its head oriented towards the south. About 1 minute and 38 seconds later, for whatever reason, the chrysalis attracted the attention of a passing yellowjacket wasp which flew into the frame from the north (left side of the frame).

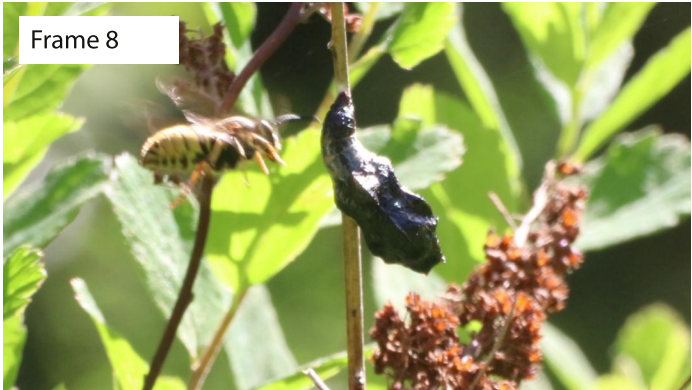


The action proceeds as follows:

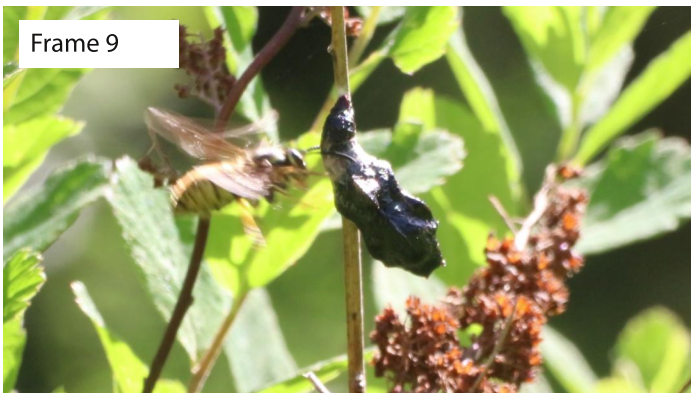
- 1) The yellowjacket approaches the chrysalis—its legs are trailing and there appears to be some rapid wing activity.



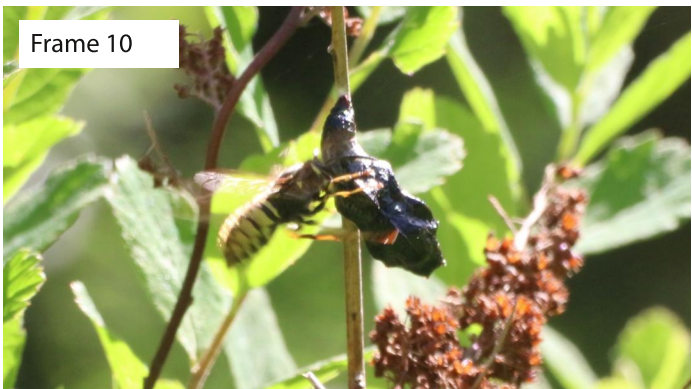
2) The legs of the yellowjacket are drawn up and angled forward.



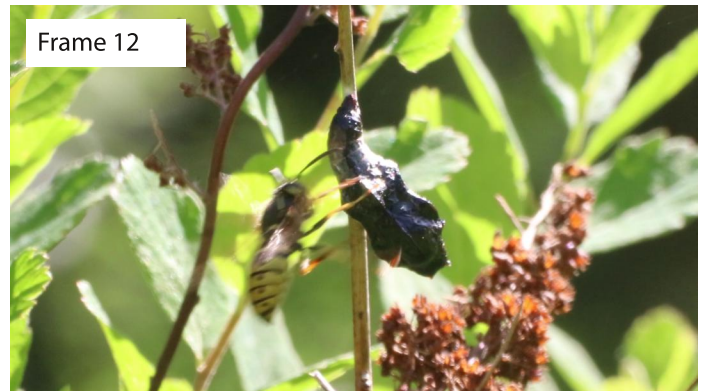
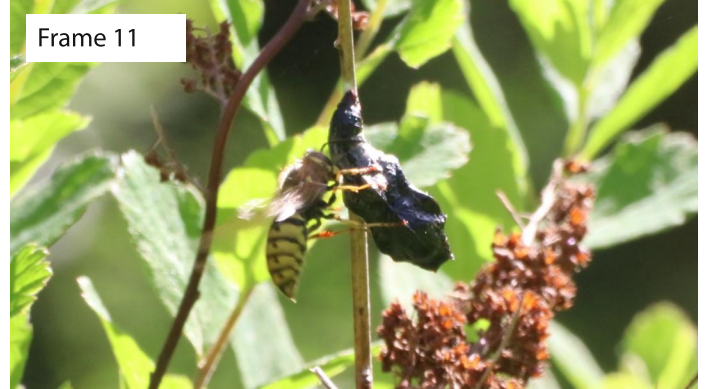
3) The yellowjacket moves in with its front legs reaching out for the base of the abdomen of the developing butterfly.



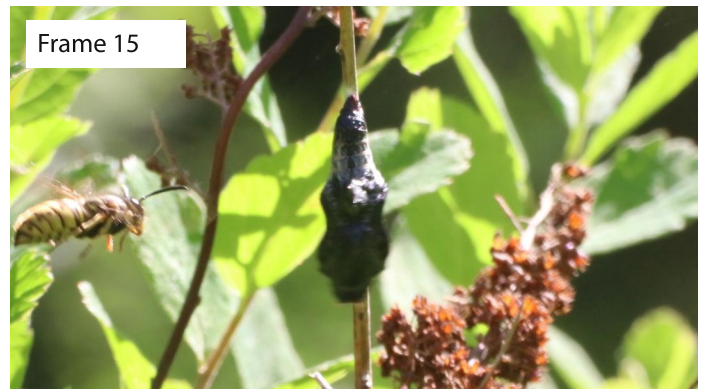
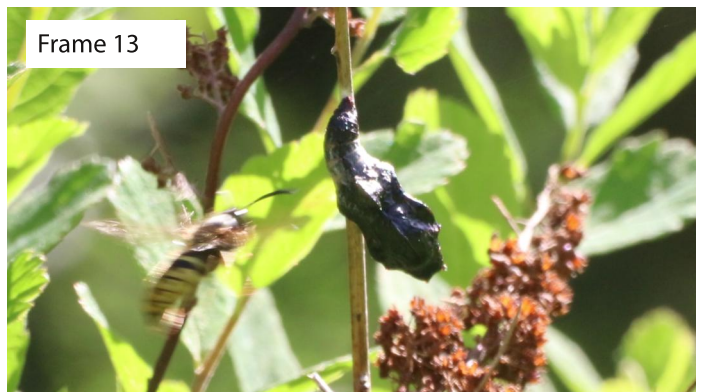
4) The yellowjacket reaches forward with all of its legs and grabs onto the chrysalis.



5) Once the hind legs are locked on, the yellowjacket pulls back attempting to capture the chrysalis. The chrysalis moves slightly in the direction of the pull. At this point, it is not clear whether the yellowjacket disengaged for some reason or lost its grip.



6) The yellowjacket backs off initially but continues backing up as the chrysalis swings to the north.



7) The yellowjacket moves about while facing the chrysalis.



8) Eventually the yellowjacket circles in front of the chrysalis moving towards the right (south) and leaves the area.



The yellowjacket did not make a second attempt to capture the chrysalis and the developing butterfly assumed its former position with its head pointing towards the south shortly thereafter.

The interaction began and ended quickly. From the time the yellowjacket first entered the field until it left empty-handed only 30 frames were recorded, 1 second of video.

Discussion

I do not know what attracted the yellowjacket to the chrysalis. It is possible, since the butterfly emerged later that day, that some small visual and/or audio cue(s) gave it away.

Once the attempt to capture the chrysalis failed the yellowjacket backed off and watched for a short period as though assessing the situation. Its failure to make a second attempt might have resulted from one or more of the following factors:

- 1) its failure on the first attempt indicated that the chrysalis was too securely attached;
- 2) the subsequent rapid motion of the developing butterfly changing its orientation from south to north;
- 3) the sound that must have come from this rapid transition (Dolle et al. 2018);
- 4) some other reason(s) (e.g., perhaps there is some deterrent odor associated with the emergence process).

Various investigators (e.g., Dolle et al 2018) have pointed out that chrysalis motion is an anti-predator defense. Certainly this seems true in this case. There were however no apparent predator-related reasons for the other motions I recorded in the images from this season and those from 2016. Admittedly two examples do not represent a big sample, but it seems that at least some butterfly pupae do move for their own reasons (e.g., thermoregulation), unassociated with any physical disturbance. After all, the developing butterfly eventually resumed its former position without any external stimulus.

Question

Might an attack from the south have been more successful?

References

- Dolle, P., P. Klein, O.W. Fischer, H.-U. Schnitzler, L.E. Gilbert, and M. Boppré. 2018. Twittering Pupae of Papilionid and Nymphalid Butterflies (Lepidoptera): Novel Structures and Sounds. *Annals of the Entomological Society of America* 111(6): 341–354 (Access the advance PDF at <<https://doi.org/10.1093/aesa/say029>>. [Accessed May 15, 2020.]
- James, D. and D. Nunnallee. 2011. *Life Histories of Cascadia Butterflies*. Oregon State University Press, Corvallis, Oregon. 447 p.
- Lyons, R. 2016. Diurnal Activity of a Lorquin's Admiral Chrysalis. *Bulletin of the Oregon Entomological Society* 2016(4): 22.

Scheduled Insect Classes and Activities Remaining in 2020

Lepidoptera Activities

Northern and Central California

For the latest information on count dates in Central and Northern California, please refer to the website <http://www.sfbaywildlife.info/activities/butterfly_counts.htm>. The planned dates for 2020 have been posted. Please check the website and register with the trip leaders. Check local area websites for travel suggestions and current restrictions.

North American Butterfly Association (NABA) Eugene–Springfield Chapter

Information on the Eugene–Springfield Chapter including the results from some of their past outings can be found on their website at <<http://www.naba.org/chapters/nabaes/>>. As of the publication date, no field trip or meeting announcements have been posted for the rest of the year.

Washington Butterfly Association (WBA)

For the latest information on WBA meetings, field trips, and citizen science projects please click on the EVENTS tab on their website, <<http://wabutterflyassoc.org/>>. The annual study gathering has been cancelled for 2020.

A New eButterfly Takes Flight

e-Butterfly.org just completed an exciting and ambitious expansion. They have expanded and added new tools to help you track your observations from Central America and the Caribbean Islands to the far reaches of the Arctic.

eButterfly now covers over 40 countries and more than 3,000 species, many of them rarely studied, the site allows anyone to report, store, organize and view vast amounts of data on butterfly distribution and diversity across the region. e-Butterfly.org displays lists, photos and real-time maps of butterflies from its ever-growing reservoir of nearly 400,000 butterfly observations shared by nearly 8,000 observers.

If you have not visited lately, please come back and experience the new social media-inspired features added to facilitate sharing and communication between users to make it a better experience for you and build a more connected and engaged community. Visit <<http://www.e-butterfly.org>>.

– extracted from an email received May 20, 2020
(shortened and slightly modified)

Classes from the Siskiyou Field Institute

The Siskiyou Field Institute (SFI) is located in Selma, in the Illinois Valley about 20 miles south of Grants Pass off Highway 199. The course catalog is available from their website, <<http://www.thesfi.org>>. Most of the programs run out of the Selma facility and involve a fee.

Please check the website for the current status of any course(s) you might be interested in. While there were several insect-related classes scheduled to run over the summer, there is only one still listed on the calendar at this time.

Birds, Blooms and Bumbles on Mt. Ashland

Instructors: Frank Lospalluto and Kristi Mergenthaler

Date: Sunday, July 19, 2020

Location: Ashland, Oregon

(Catalog page 22)

Classes at the Malheur Field Station

For information and registration details on classes at the Malheur Field Station, please visit <<https://malheurfieldstation.com/programs>>. One insect-related class is currently listed: Entomology in the High Desert scheduled for September 2–5, 2020 with Matt Medeiros. Please check their website for current information.

Other Activities

Xerces Society Information

For events being held online or locally, please check the Xerces web page, <<http://www.xerces.org/event/>>.

If you are interested in working on a project, please visit their citizen/community science page at <<http://www.xerces.org/community-science/>>.

For other materials of interest, please check out their blog, <<https://xerces.org/blog/>>.

Oregon State University Extension Service

For programs, projects and events presented by the Oregon State Extension Service, please visit <<https://extension.oregonstate.edu/about>>. Click on the “GET INVOLVED” tab to bring up a menu with some general links. Click on the link of interest to bring up a page with the specific offerings.