Wisconsin Bumble Bee Brigade Advanced Identification Webinar Transcript

12:03:32 Now that we've gone through that introduction of how to use the Zoom format, I want to do some introductions. My name is Eva Lewandowski. Most of you know me. I am the citizen-based monitoring coordinator at the Wisconsin Department of Natural Resources

12:03:48 and I co-coordinate the Bumble Bee Brigade with my two co-workers who are on the call today.

I am going to mostly be doing the Q&A box, so you won't hear too much from me today, but I did just want to really thank you all for being volunteers, for being so

12:04:04 dedicated to the project, and to taking the time out of your day to brush up on your ID skills and learn some more about advanced ID.

12:04:14 Terrell, do you want to introduce yourself?

12:04:17 Sure, I'm Terrell Hyde. I second everything that Eva just mentioned in terms of how much we value your participation in this project. I work on the data end of the Bumble Bee Brigade project.

12:04:32 And thanks. Jay?

12:04:35 Hi everybody. Thank you for joining today. Yeah, so my name is Jay Watson. I'm the terrestrial insect ecologist for the department. I work in the bureau of Natural Heritage Conservation. And I've crossed the state looking and helping out rare and endangered insects.

12:04:54 So, for this project, you know we're obviously focused on bumble bees, but I focus on other species too. So, thanks, thanks again for joining.

12:05:05 So, just getting started here, make sure my thing's moving.

12:05:12 Here we go. So, just kind of an overview of what we're going to be covering today.

12:05:18 We're going to look at a couple of features that can help us determine the different sexes of the bees when we're getting our photos.

12:05:27 We can count abdominal segments, and then a structure also on a female bee, but that's not a cuckoo bumble bee but has a corbicula or the pollen basket.

12:05:40 And then we'll look at different coloration patterns

12:05:52 starting with the head, thorax and abdomen that can be very helpful with ID. And then some other features: eye size, hair length, and what we call cheek length or malar space. And then we'll walk through some ID practice of some of the trickier ones that

12:06:00 we have come across.

12:06:04 So, just starting out with the basics, I threw in here the photo of, and this can be found on the website, of the parts of the bee. And mainly what we're looking at here obviously we have the head, the thorax, and then the abdomen, which

12:06:20 we divided into sections. You'll often see in our responses T1, T2, etc. all the way to T6 for a female and T7 for a male.

12:06:32 So, the males have one extra segment.

12:06:36 So, that's what we're talking about here, is those individual segments on the abdomen of the bumble bee. And so you can see here, in this diagram of the female,

12:06:48 she has that last segment is pointed, so that's where the stinger would be on the female.

12:06:57 So, that's helpful if you get a photo that shows that; that can be really useful to tell if this is a male or female. And then on the male, here on the right, that last segment, the seventh segment, is more rounded. Sometimes it's a little trickier and in a photo it

12:07:12 can be tucked underneath but,

12:07:14 you can, if it's visible, you can use that to help tell if it's a male.

12:07:22 And then just quick in looking at the photo since we'll be talking about legs too, they have the fore leg, the middle leg and we will be focused on the next feature here is found in the hind leg of the bumble bee.

12:07:38 A quick example to go through, these are photos that were submitted to Bumble Bee Brigade website and we do our best when we go through an ID, counting the segments and I threw arrows in here trying to really show the separation. So we

12:07:55 have our first segment, our second, our third, and fourth for the species is the yellow bumble bee or Bombus fervidus. So, T1 through T4 are all yellow and then we get this fifth segment, T5 is black, and then we have what I was pointing out earlier, this the last segment,

12:08:14 the six segment is pointed. So we know that that would be a female. Versus, this is the male of the same species, obviously going to a different flower here. It's a little tricky sometimes to see that first segment because the wings can cover

12:08:30 it, so you have to do your best trying to see that separation. You can see there's a little divider here. So we have our first segment, second, third, fourth, fifth, and then for this, the six segment is black, and then we see the seventh segment is

12:08:46 is more rounded and we don't have that pointed like we see in the female. So that's an example how you can use to help determine the sex of the bee.

12:08:59 Another feature is we call the corbicula, or the pollen baskets. This is the structure used to carry the pollen for the females from the flowers back to the nest to provide for their offspring.

12:09:12 And so that's the structure on the hind leg.

12:09:16 It's the tibia portion of the leg.

12:09:33 It's a bare area, if no pollen is packed in there. It's nearly flat, little bit concave on the outer surface of the hind leg. And it has these special hairs that help hold the pollen in place. So if that's full it's pretty obvious, so that can be used

12:09:40 to tell that that's a female. If it's empty like in this picture on the right of the rusty patch bumble bee queen, you can still see it's really flat and expanded, and then shiny

12:09:53 in the center where they put the pollen when they're collecting. So just to point out that this structure is not present on males, or on cuckoo bumble bees. So it helps for most of them and I guess I was going to mention the beginning I forgot but

12:10:09 we have 20 species of bumble bees found historically in Wisconsin, and five of those are cuckoo bumble bees.

12:10:21 So, just to, you know, cover that. That's what this presentation is focused on, the Wisconsin bumble bees.

12:10:30 So here's another look at this without pollen. We have

12:10:36 this is the tricolored bumble bee or Bombus ternarius. And you can see that structure here circled in red. It's, bare in the center with the long hairs on the side.

12:10:46 And this can be a little tricky, if you don't get an angle like this and you get more of a side angle. It can look narrow, so that's something to pay attention to when looking at your photos.

12:10:59 But on this male on the right, you can see that there's hair within that area where on the female

12:11:06 there's no hair in the center so that's helpful to, to look at and notice too. And just this diagram up here,

12:11:16 the females tend to have a wider leg. It looks like in that expanded area. Versus the male it's narrower. And again, photo angle is critical trying to distinguish that feature.

12:11:28 So, moving from determining the sex to how coloration can be used to help ID.

12:11:36 Starting with the head. We often really look at if you can get photos of the head which sometimes can be challenging, but the face color, so right here where the antenna

12:11:49 connect.

12:11:49 It can either be all yellow like in this northern amber bumble bee, or it could be black or it can be intermixed. One of our cuckoo bumble bees has yellow just at the base of the antenna. So there's a variation of that so that's something

12:12:09 that can be really helpful. And then what we call the top of the head or the vertex here. This is a really important feature that if it's all yellow it helps or versus all black or some inner mixing.

12:12:24 So that's a really critical feature to try to get in your photos if you can.

12:12:32 Then move to the middle of the thorax of the bumble bee,

12:12:37 you'll often see in our responses if you've submitted to Bumble Bee Brigade,

12:12:42 different comments like black oval versus a black band. So here's some photos that are trying to highlight what we're talking about with that. And, which usually works for rufocinctus, which can be a very tricky species to determine because there's so many

12:13:01 different morphs. But for most of the workers and the males, they tend to have this nice oval dark or black hair area between the wing pads that can be used to help ID them. Versus seen on some of our other species what we call a black band, which

12:13:25 fervidus has usually a narrow black band, extending from wing pad to wing pad. And this can also be found on that previous species, the northern amber bumble bee and some of our others like auricomus that have yellow on the back of the thorax. Those all

12:13:40 have black bands running across. So that's what we're talking about there. And that can be used to help separate these out when you're going through your photos.

Versus, you can also have what we call black dots.

12:13:56 A good example here is this vagans, which just tends to be the typical black that you see on a vagans. It can be a little wider or maybe a little narrower, but they tend to always have some type of like this.

12:14:12 And this is can be found in some other species too like bimaculatus or griseocollis. But that's what we're talking about when we mean black dot. Versus some of the species have a black triangle, or a dip that extends posterior or toward

12:14:32 the abdomen. And sometimes the angle your photo that doesn't always show up right away.

12:14:39 So, something to pay attention to.

12:14:42 But this is also found on our cuckoo bumble bee flavidus, but also in tricolored, and sometimes our affinis workers have that extending backwards too.

12:14:56 So that's what we were mean when we talk about a black triangle or dip.

12:15:02 And some other features moving to the abdomen.

12:15:07 We often put in and we're talking about a half moon versus two lobes of yellow in the center.

12:15:14 So this is examples of what we're talking about with that on this photo on the left here, we have a Bombus griseocollis that the first segment is all yellow.

12:15:27 And then the second segment has this nice half moon that extends all the way from the left side to the right side, and then this bottom photo I'm really trying to point that out that it goes all the way down to the outer edge. That band can be the half

12:15:42 moon can be either yellow or brownish for this species. So, it varies, but it always tends to extend like this. They can get a little trickier where that that's almost full, but for this example.

12:15:57 That's usually what we see, for most of the griseocollis. Versus on the right photo here, we have what we call the two lobes in the center. And it's always black (and my arrows not showing up here).

12:16:14 But, so you can see here, that's always black on the outer edges and then yellow in the center and this can vary too. This is a nice example of those lobes but it can be smaller too.

12:16:28 But that's the difference here we're really trying to point out is the half moon versus these two lobes between these two species. Just to point out since I covered it and last slide,

12:16:38 these are examples of what the black spot, or dot in the center, looks like on brown belted not quite as obvious in this photo but two-spotted has that too.

12:16:53 And like I said, rufocinctus can be a tricky one to ID, since it has so many color morph variations.

12:17:02 Just trying to point out that there is a morph that has T1 all yellow. And then on T2 it has very similar to what we see on griseocollis, but it typically doesn't extend all the way down to the sides. It's usually more toward the center of that segment

12:17:24 in the middle.

12:17:27 But what really stands out that helps us as I mentioned is that they usually have this nice oval, dark oval on their thorax.

12:17:37 So that's something to pay attention to.

12:17:40 with the rufocinctus morphs.

12:17:45 So moving to some of the other features I mentioned and I'm just going to cover these briefly, since we already on our website you can find a PDF that was put together more in depth on this for advanced ID features.

12:18:02 So eye size, we have three males that have enlarged eyes. Our black and gold or auricomus has greatly enlarged eyes, so it's pretty noticeable. Same with our brown belted or griseocollis, but our third, rufocinctus, has somewhat enlarged eyes so it

12:18:21 can be a little bit trickier.

12:18:23 And again, it depends on your photo angle, trying to tell where the black of the eye can blend in with the face. You got to look close and look at other photos angles and then you can usually see it kind of pop out

12:18:39 if you get the right angle.

12:18:41 And here's an example of a male brown belted with those greatly enlarged eyes They almost take up most of the head. Kind of reminds me of what you see a lot of times on some of our flies with those big eyes. Versus the normal size here of the female.

12:19:01 They're not as bulgy.

12:19:04 And then the example of the more somewhat enlarged eyes on our rufocinctus males. So this is a nice angle showing that. Versus, this is just an example of a rusty patch, you can see the normal size eyes.

12:19:21 And then hair length can vary quite a bit, by species and by sex. So, in general the males tend to be more or have longer hair versus females and obviously the extreme ends of very short versus long are a little bit easier to distinguish.

12:19:42 So just a list here quick, the

12:20:04 auricomus, griseocollis and pensylvanicus have very short hair. Versus on longer side are perplexus and vagans. And then we have the group in the middle that's harder to tell.

12:19:59 And here's just an example of that extreme ends, we have the short hair on this auricomus. Nice, really short compact hair. Versus on this

12:20:11 male perplexus is nice long hair here.

12:20:16 And then the third feature that can really be helpful.

12:20:21 And again, this comes down to getting photos of it can be a challenging, but what we talk about with cheek length or we also mentioned you seen different field guides as head length or ocular malar area.

12:20:35 And that just refers to how long the cheek is compared to the width of the cheek so that ratio.

12:20:41 And this also varies by species and requires good photos. It's really more of a under the microscope kind of feature, but sometimes we get good enough photos we can tell that. And just the general shape of the face

12:20:57 overall, can be seen. And so here's sorting these out,

12:21:03 the shorter end versus the longer end we have our rusty patch and our griseocollis and rufocinctus and terricola all of short nice square faces. Versus

12:21:16 auricomus, borealis, fervidus, pensylvanicus and vagans are all longer faces. And like impatiens and bimaculatus are in that middle of the road area.

12:21:27 Just to point that out because that's a lot of words and pictures are a lot easier to see this. And, and a great reference is

12:21:38 the Bumble Bees of Eastern United States has good photos where they kind of try to circle that and point out the face shape. So, you can see the short, this more compact squarish shape. Versus our longer cheek faces, and then just side views of what they're

12:21:55 really talking about. You know that length shorter than width versus, you know longer than wide here.

12:22:04 And then just an example of photo of that short face, which we use a lot when we're ID'ing on rufocinctus just to help kind of make sure that "yep that's right" since they vary so much in their coloration patterns. Versus here's an example

12:22:21 of a nice fervidus with a long face.

12:22:28 Just some tips to help with that, because you know you'll look at your photos, and you'll be like what what's going on here, but you can use the Explorer data tab on the B3 website and you can look at other people's photos and you can sort that by species

12:22:46 or the sex of the species to help

12:22:49 look at those different features to get a better handle on the hair length and face and eye sizes and what to expect.

12:23:00 So before we move into the next section here, it's going to backup quick.

12:23:06 I think we're doing okay on time.

12:23:10 We could open it up to anybody has some questions.

12:23:16 Okay Jay, so we had one question about the corbicula and the queen if the queen moistens the pollen before putting it into the pocket.

12:23:28 Yes, so they, they do pack it in and it really depends on the humidity outside

12:23:37 if they need to add any moisture to it or not so that can vary. You'll often see them sometimes when it's, you know, pretty humid out sometimes they're having problems with it sticking too much and having to try to groom it out so that can vary. They

12:23:51 can add moisture to it to try to make a nice packed ball so they don't lose it on their flight back to the nest.

Alright, we had another question

12:24:01 with the thorax patches, like the black oval.

12:24:06 Just as bees get worn and old.

12:24:12 Are there other traits that folks should be keying in on when a bee is worn.

12:24:19 That's a good point I did have that in my notes and I forgot to add that. Yeah so as bees

12:24:33 get more worn and older they will lose a lot of that hair so that gets a little bit hard to tell, but another good way to tell too is if their wings are really worn so you kind of know is that hair loss or are they just, is that what they look like.

12:24:38 So their wings will be pretty frayed on the outer edges too as they get older.

12:24:46 Yeah. So, another thing is sometimes they have pupil damage too when they come out and, and they have hair problems that can make them look a little bit different too sometimes. So, or when they're wet.

12:25:00 That's another thing to pay attention to because it can mat down a lot of the hair and make it look a little different. So, there are some, some ways to tell is it hair loss or is that just what the patch on the thorax really looks like.

12:25:13 I hope that's answering the question.

12:25:19 Any other questions Terrell?

12:25:22 I think we are good. Okay, I'm going to keep moving forward to leave more time at the end to discuss any other questions.

So, moving into some examples of, that we've had, you know, some challenges with challenging IDs.

12:25:40 Is this example of a rufocinctus male.

12:25:44 And I just like to point out here this is what you're, you're shooting for here is trying to getting a nice side shot, a nice face shot if you can and then a back or dorsal view side. So, it's not always how it works.

12:25:57 I understand that, but you know that's the ultimate

12:26:01 goal if you can get there.

12:26:03 So just walking through this and kind of following the format of our webinar today. And this is how we really go through an ID, when we're verifying on your submissions to us is first we look, is this a male or a female. So, we can use

12:26:21 counting those, you know segments, and it's not always clear cut because it's hard to see that last tip, but so we can kind of run through here, you can see 123456 and you can tell there's a little bit past six so we would probably lean to well doesn't

12:26:39 look pointed either that that's a seven segment.

12:26:43 We could also, you know, look here we could see in this third picture on the right, that it's a nice rounded end to the abdomen, so we know it's not pointed, so that really points us toward that this is a male, then we can use that corbicula. Does

12:26:58 it looks like it has on the hind leg area, a flattened area for collecting the pollen. And like I said, angle is really important. Like this doesn't show it as well; we can't see it there.

12:27:10 And this is a little bit different angle too. So, we can't always tell right away it. Does not look like it, but using those combinations of the abdominal segments, corbicula if we can tell, and then we can go into some of those other features like we mentioned.

12:27:25 It looks like it has these enlarged eyes. So that helps us know that oh yeah that's probably a male.

12:27:32 And then we can look at some of those color patterns that we went through here starting with you know the head.

12:27:39 We can see it has black on the face. It has this nice yellow vertex. And you can see different angles how that can vary in how it looks. The side view shows nice yellow. Looking from the top, we can see some inner mixing of the yellow.

12:27:54 And then moving to the thorax. Side shot shows us more looking like a band. But if we get a nice dorsal view, we could see that that's the oval shape to it.

12:28:06 So, that's where really, multiple angles is really helpful with ID.

12:28:13 And then we can move on to the abdomen coloration. So this is a T1 and T2 are yellow, and the rest are black. So, that combination of all those different features we just ran through really helps rule out

12:28:29 vagans since. Oh, I forgot to mention, you can kind of see it, this has a shorter face. It’s not as clear in these photos, but you can see it’s on the shorter end.

12:28:41 But we can run through and rule out vagans because it doesn't have a little more black dot on the thorax and has a shorter face.

12:28:50 Griseocollis we can rule that out. Same with the thorax pattern. Rufocinctus female,

12:28:59 we already saw that it has enlarged eyes, or slightly enlarged eyes and that it's got the rounded seven segments, so we know it's a male. So that's really how walking through that and it really comes down to your photo angles to help see all those features.

12:29:18 So, Jay. How about hair on the bottom of the abdomen? And I'm assuming the question is about the underside of the abdomen.

12:29:26 Are there certain species that have it more than others? Is that a diagnostic feature.

12:29:34 So, on the males, typically it's not really a diagnostic feature for telling the species.

12:29:40 But usually, on the sex the males tend to have some more yellow coloration running on the underside of the abdomen. You can even see on this rufocinctus male there's a little bit of yellow, yellow going on underneath there but you wouldn't be able

12:29:55 to use that tell the species ID for our species.

12:30:04 So moving here to another, often challenging one to ID.

12:30:12 This is citrinus male. So, first of all run through, rule out, is it a male or a female. This one is a little trickier because I didn’t put any really solid photos in here of seeing, because this is typically how we see them,

12:30:16 to see that the segment count very well but you can see it on this middle photo. You can see T1 2 and 3 are all yellow, then T4, 5 and be get a little bit harder to tell down here because it really blends in with the background. But we don't see really

12:30:50 a point. You know best we could tell and same with the side shot here, we can see it extends a little bit outward. So the abdominal segments are harder to tell.

12:31:00 in this series of photos, but we can look and see that the hind leg is pretty clearly visible and it definitely does not have a corbicula so we know it's not a corbiculated group of bumble bees.

12:31:16 And so we can kind of rule out some of those other ones looking at cuckoo bumble bee, other cuckoo bumble bees. So, we can start with those. The head is all; the faces black and the thorax, I mean sorry the vertex is yellow.

12:31:30 You can see it a little better on this right photo here.

12:31:35 And what it really helps separate this out from a rufocinctus male, is we can see the eyes are normal size. They're not slightly enlarged like we'd see in a rufocinctus male.

12:31:50 And then we can move on to the thorax here and this has this classic pattern we see it all, most of the time in this species, this nice dip, black triangle dipping backwards here.

12:32:03 So that's really helpful feature for ID. And then really typical is the T1, 2, 3. Once in a while we do see a little bit of yellow kind of on the edges of T4.

12:32:18 And that's kind of like what the question that was just asked on the underside some of that yellow running down the sides is kind of what we're seeing there.

12:32:27 So that's that combination of features, really can get you the ID for the citrinus male.

12:32:40 And so, moving to the next one here, this is auricomus female, which can be really tricky to tell from our terricola and pensylvanicus.

12:32:55 So, first of all, tell if this is a male or a female, and some of the photos have pollen in the corbicula so that makes it pretty easy to tell right away, you can see it on these two photos.

12:33:08 But, even without the pollen we can see this nice bare area with long hairs on the hind leg. So we could see it has a corbicula, which you know it's a female. And then we can start looking at those coloration features starting with the head. It has black face,

12:33:26 yellow vertex, which this species can be pretty tricky, because we've seen it have very few yellow hairs on some of the morphs. But most of them tend to have a pretty good amount of like this on the right photo, pretty good amount of yellow on the vertex.

12:33:47 And then their thorax can vary quite a bit. They can either have pretty much from the start of the wings black all the way running down to the back of the thorax. So a large black area to more like the middle photo where they have more of that

12:34:05 black band with yellow in the posterior of it. So they, they can vary there.

12:34:14 And then they also can vary on their abdominal coloration. So, we often see this T1 is all black, like the left and right pictures, but we do see like this middle photo T1 can be yellow, but it tends to if it does have yellow,

12:34:34 they have black toward the center. Where pensylvanicus would be the opposite. It would be yellow in the center, and black on the edges if it were having yellow on T1.

12:34:49 So then, we're also moving down the abdomen there, they have yellow on T2 and T3 and then the rest black.

12:34:57 So, some other features we can use that are helpful with this species is they have these very dark black wings.

12:35:03 They also have really short hair, and they are one of our largest bumble bees, whether you're looking at the workers, males or queens. But that gets a little bit, you know, you have to see a quite a few to get a better handle on size. But they are a very

12:35:20 large bumble bee.

12:35:22 So, just to rule out yellow banded or terricola, they have lighter colored wings so that, that's helpful. And they also have a black vertex. Pensylvanicus will have also a black vertex, but they do have the dark wings too.

12:35:40 So, the pensylvanicus and auricomus can be pretty tricky with some of the morphs. Seeing that vertex is really an important feature.

12:35:54 So Jay, while we're talking about wings. What other species have dark wings and is that a good diagnostic feature as well? We have a couple of questions like that of, you know, helping to narrow down species by using features like wing color.

12:36:11 Yeah, the only two that have dark wing color that we have in Wisconsin or the pensylvanicus and auricomus. All the rest have more of a lighter, smoky kind of, if you want to call, that colored wing.

12:36:28 Is that, does that answer those questions then?

12:36:32 So, that's wing color

12:36:34 and we can, so antennae length as another question. Antennae length gets pretty challenging.

12:36:42 Overall males actually have an additional antennal segment.

12:36:48 I would, I would not use that to, for photo ID. That's more of a microscopic level of feature. I mean, it can be useful I guess somewhat, but mainly for male versus female and not for ID of species.

12:37:05 Okay. Are there some species that have like hair right at the base. Yeah, yep. So there is one species our cuckoo bumble bee insularis, both on the male and the female have black really tufts or bunches of hair of yellow hair on a black face at the base

12:37:25 of the antennas, at the top of that were to inserts into the head. That's the only one that really has that unique face antenna feature that can be used.

12:37:38 Otherwise, I'm really using this head, thorax and abdomen coloration series is, is the way to work through the IDs.

12:37:47 OK, and then before we move on from this slide.

12:37:51 just the differentiating between auricomus and pensylvanicus because other, just because they are so tricky.

12:37:59 are there other features that folks should be looking at?

12:38:05 Well there's a few other features, ones found on the mid leg, whether it has a point or not but that we've really struggled with that feature in our ID sessions because getting a clear photo of it is so challenging. So, I don't feel comfortable

12:38:25 saying that. That's for a specimen under the scope ID as of right now.

12:38:32 And then they do have also the differences, what we call, sort of their main large eyes. They also have these small what we call ocelli that are found on the face.

12:38:44 And I, if you really get a good face shot you can see this and I actually have to double check, pensylvanicus has, I think, in line with the top of the where the eyes on the top of the eyes meet, versus, auricomus, or a little bit lower, but that's

12:39:03 a very tricky feature to be able to get in photos so really the combination of that vertex

12:39:12 and then T1, knowing if this is more of a yellow T1 to tell if it's for pensylvanicus again it'll be yellow in the center and black on the outer edges versus auricomus is the opposite if it has yellow T1, it'll be yellow on the edges

12:39:32 and black toward the center.

12:39:35 So they, they are pretty challenging but really the vertex and then those other combinations

12:39:41 are the best to help separate them.

12:39:45 Great. Thanks, Jay.

12:39:48 And then some, some fun and interesting morphs that we see out there that can really throw us for a loop.

12:39:56 This example of impatiens that has pupil damage.

12:40:03 So you can see in the photo series, it has this yellow T1, but then it has these colorations of brownish below.

12:40:13 I guess I should back up here to make sure, how do we tell it's a female or male. So we can see in

12:40:21 the first photo, we could either count segments. So we can count 123456, or we can see the pointy tip. And we can also see the expanded corbicula even though it's empty.

12:40:34 You can also see it in the second photo very clear too. So you can tell it's a female.

12:40:40 And then looking at the head we could see it’s black with

12:40:45 a yellow vertex. And then this thorax pattern is classic, and in this third photo on the right really shows it for this species for impatiens.

12:41:01 They have this intermix black and yellow thorax which almost if you look at the middle they kind of have like what looks like a little seam running down the center of it.

12:41:05 So that's a classic impatiens thorax. So really helps rule out other species like rufocinctus because they have that orangish coloration sometimes or, or griseocollis which has brown on T2, or bimaculatus which is, you know, similar with

12:41:22 face length and some of the hair, you know hair collaborations. So, this, we don't see this too often. This is pretty rare to have this much coloration on impatiens running past T1. The typical is yellow T1 and black the rest of the abdomen.

12:41:41 Once in a while we'll see a little bit of yellow on T2, but it's a very small amount, typically, but having this much

12:41:51 rufus brown color,

12:41:53 we've only had a couple observations like this, but pretty kind of fun. It can be tricky to ID,

12:42:00 if you come across this. So just wanted to point out that there's, there's some of these rare morphs out there like this, and how to tell them apart. Do we know why it occurs?

12:42:10 Yeah, well they're not exactly i guess is the best answer, but they think that during the developmental stages

12:42:19 it's a temperature dependent. So when they're developing, the hair color is sensitive to temperature, something goes wrong during that stage that causes hair coloration like this. That's, that's some of the literature I've read any ways on this but

12:42:36 I think there's definitely more to it than that.

12:42:41 Similar here.

12:42:44 And this is actually, both these bees are from the same site so that's kind of interesting in its own right. But this one is one we've never seen before, so it really threw us for a loop when we first came across it. But so we can tell it's a female.

12:43:00 You can see the corbicula here in the middle photo.

12:43:06 And we can also rule out some others based on,

12:43:09 we could see it has a yellow vertex and black face, and it has this thorax different than impatiens. It has the black dot and medium cheek. So it said the middle of the road, it's not short or long so that rules out rufocinctus.

12:43:28 But impatiens also has this same similar face, but this thorax rules out impatiens because it has the dot.

12:43:45 So this is a really weird morph with T1 and then T2 being fully this color. Once in a while you can get a bimaculatus that has a quite a bit a yellow on T2, but we've never seen another one like this.

12:43:54 And I even sent it to some of the experts who've looked at a lot of these and they've never seen a morph like this too. So it's out there, just to make you aware that you can get some of these interesting color patterns. But we can rule out impatiens

12:44:08 also because this has, bimaculatus has this long and uneven hair.

12:44:14 So, and then brown belted has really short hair too. So we can rule out, even though brown belted has that same dot on the thorax.

12:44:24 So with that, we have plenty of time for questions, so I'll open it up for questions out there.

12:44:34 Another question that we had Jay was about specific floral preferences based on species, maybe you know regarding tongue length.

12:44:52 Right yeah so we definitely see, for example I've noticed rufocinctus has a very short tongue. They go to a lot of our, you know, coneflowers like yellow and purple coneflower.

12:44:59 And I've seen, for example vagans has a long, they go to our clovers or anything that takes a longer tongue to get into. So there is some of that you can use to help, but I've also seen you know rufocinctus once in a while, go to those other plant

12:45:16 species so it can happen. So you can kind of use that as a help separate them out as a starting point, but I'd always, you know rely on the color patterns of the, of the bee to help get the species.

12:45:50 I guess I could just add to that, we have some species like rusty patch that they go to some of our longer, like our mints, even though they can't get, like bergamot for example, they can't get all the way in to get out the nectar, so they just chew

12:45:52 a hole at the base to get to the nectar. So they nectar rob. So you can have that. And then some of our others will go to that too, like impatiens I've seen

12:46:01 they use that hole that rusty patch made in the corolla to get the nectar out. So it varies a lot out there, there's a lot of stuff going on.

12:46:15 Another question, could a morph actually be a hybrid?

12:46:20 Is there anything in the literature about species hybridizing?

12:46:25 I haven't seen that.

12:46:29 I guess I don't know the answer to that one. Terrell or Eva, do either you guys have any thoughts, have you seen anything on that or, I haven't.

12:46:39 I have not as well.

12:46:44 We have a request to go back to the cheek length comparison slide.

12:46:53 So this, this one with pictures.

12:46:59 Yeah and we also, it says it,

12:47:03 Oh, the list of species for the cheek length.

12:47:08 And this also can be found on our website under our resource tab, under Advanced ID for these different features of hair length, cheek and eye size.

12:47:24 and I think there was an earlier question too, about other features and we've as a team have talked about the need for this as well of listing out, you know, species that have short cheeks versus long cheeks, if you've got a good shot of that, and

12:47:42 other one was the yellow beard species.

12:47:47 Yeah so vagans would be the classic one that we have that a lot of yellow on the face

12:47:58 for example. I guess you could call it a beard too.

12:48:02 So on the B3 site we do have these advanced ID slides and the ones that are part of this presentation we'll also make slides for those as well too, but we're continually adding, so hearing back on

12:48:15 what other features would be good to have is good.

12:48:22 And one thing that a lot of people sometimes struggle with is really differentiating the segments, so the terga. And you went over that a little bit Jay, but maybe since we've got a few minutes,

12:48:33 could you talk just a little bit more about that? About how to tell if it's actually a different segment versus, you know a shadow, or a bit of the hair parting.

12:48:44 Yeah, so I'm just going to go back to the.

12:48:47 Sometimes people will think you know T1 and T2 are just T1. Or will think T1 is both T1 and T2.

12:48:55 Yeah, T1 can be tricky on some species it's not always as clear cut.

12:49:01 But yeah, you're really, you know, and it depends like if they are, kind of their abdomens tucked it can look a little different verses really extended outward. But you're really looking for that, that division

12:49:14 really where the hair changes and actually there is on the exoskeleton there's a separation there so it's where the abdomen flexes.

12:49:26 So, that's what you're looking for. And I, and I agree it can be challenging sometimes to see that T1 versus T2. And then also the same at the tip of the bee.

12:49:38 So, it's not always visible in some photos, especially like Eva mentioned if the hair is matted down or missing or full of pollen and I guess is another thing that can really make it hard to tell too.

12:49:54 That's something just to note in general that sometimes it can be so loaded with pollen that some of the like the thorax features aren't visible or stuff like that. So, that's something to pay attention to is it hair, or is that actually pollen that

12:50:08 you're seeing making the coloration?

12:50:11 But yeah, you're really looking for that separation.

12:50:14 And this obviously I chose a photo here that, that's pretty clear cut, but it can be difficult sometimes. And like I mentioned too, the wings can kind of cover some of that too.

12:50:28 If you have anything to add to that too Eva, feel free. No, that's great, that's that's perfect. We do have a couple more questions.

12:50:39 One asking, do we do we use phenology to help distinguish tricky ideas? Are there some species that phenology is particularly helpful for?

12:50:51 I guess I mean you could use for phenology to like for example right now, we know that anything we're going to be seen through what throughout the springtime, at least early spring before we get into a little bit later, is all female queens coming out. So

12:51:07 we can really use that to help us. And then as we move in we'll start having, you'll see really little small tiny sized.

12:51:16 And those are the first brood of workers is usually pretty small because they just getting, the queen is just getting enough resources to get to the colony going to get out there to get some extra help, you know for foraging.

12:51:29 And as the season goes on some of those next broods get larger. So, we know at least all those first ones are female so that that's helpful for what to look and expect.

12:51:42 But as we, and some of our species like by bimaculatus and impatiens, affinis are, I guess also perplexus too, are earlier. And we have on our website you can, as we get more years of data

12:52:00 this will really be helpful. But each season can really be different like we're, we're way earlier this year than we were really the last two springs at this point.

12:52:10 So some of that varies by season but in general, the species I just mentioned are earlier, they, they get their colonies established earlier.

12:52:21 So you'll notice, expect males coming out a little bit earlier for those species. Like we can get male bimacs by end of June

12:52:32 on some colonies in southern part of the state. So I guess I don't know if I'm exactly answering that question fully, but it gets complicated as we get when males can be coming out because it can vary based on how successful that colony is.

12:52:49 And some have problems and they they produce, you know males early and different things affect that development.

12:52:57 Yeah, I think that's, that's great. Just to summarize generally no we don't use phenology to differentiate species, but yes we do use it to differentiate sex.

12:53:09 Another question, somewhat similar in terms of how, you know, other pieces of information to identify species. Is their guidance if some species are more prevalent in different parts of the state?

12:53:20 And we do, we do have a little bit of information about some in the north and some in the south. Right, so you could, you know really a great resource well, like in our field guides like Bumble Bees of North America and Eastern U.S. have really kind of ranges

12:53:38 for them but they're pretty wide, you know, ranges. If you go to our explorer tab and just search the species, you can really see where they've been found.

12:53:50 For example, some of our species are really forest dependent species like ternarius. Once you move away from large tracts of forest, which would be for us northern part of the state, I guess we have you know like some extending down into central and then

12:54:11 in the southwest, but they're less common there.

12:54:15 So you can use some of that. We're still learning more about that at this point. But definitely, I would just go and look at the on our website, type in the species on the Explore tab and you can see the ranges of where at least we know they've been found

12:54:29 now. As we learn more there could be some extension to some of that.

12:54:37 All right, a few more questions here.

12:54:41 Since rusty patch queens don't have a rusty patch, what are the specific keys that we use to ID them.

12:54:51 Great question.

12:54:51 So the specific is really they have a black vertex, they have a short face.

12:54:57 They have a black dot on the thorax, very similar to how vagans does. And they have short hair. And they have a full T1 and T2 that are completely yellow, and then the rest of their abdomen is black.

12:55:14 And they’re a pretty large bee.

12:55:25 I guess then if you see them nectar robbing and stuff like that that's helpful too. That’s additional observation stuff. But that's what we use.

12:55:31 In the queen's I've seen so far this year are not carrying any pollen, does that mean that they don't have a nest yet and are only nectaring to feed themselves?

12:55:40 Yeah, so they've really just come out in the last really week, I guess we maybe had some earlier up a few earlier observations, but really they're just emerged, they're they're starting to come out they're finding some, some food just to keep going.

12:55:56 And then they're going to really spend a lot of time looking for nest, nesting spots. So you'll see them nest searching.

12:56:03 Not until they actually established a nest that you see them then carrying back pollen with their pollen baskets full. So, depending on how the season progresses here that could be pretty soon for like bimaculatus, but, you know, it kind of depends if

12:56:19 we have a lot of rain coming up here. That's not really, you know, good foraging and searching weather for them. So, but that's kind of how it works.

12:56:35 All right, we are caught up on questions at the moment but we do have three or four more minutes left if anybody has a last minute question that they want to type in.

12:56:46 Or of course we're always available via email.

12:56:50 Jay any last kind of big picture thoughts about identification.

12:56:56 Really just be patient trying to get good photos and I guess I'll just point out that getting photos right now can be very challenging. Since, like I mentioned the queens are really just getting a little bit of food for themselves and nest searching, so

12:57:12 they're, they're not staying in one spot very long so don't get frustrated.

12:57:19 As they get a colony established that's when they become a little bit easier to photograph and really do your best to get those different angles to submit to help with your ID of them.

12:57:33 And I guess I'll just add that we've had so far this season, we've had now rusty patch has been observed as of yesterday and today. And then we've had impatiens, bimaculatus and fervidus, which was kind of surprising since that tends to be a little

12:57:48 bit later in the season they, they tend to come out later.

12:57:54 So far, and all those are from southern Wisconsin. Off the top of your head, Jay, are there counties that we would love more observations from?

12:58:06 Definitely.

12:58:07 Clark County if you're ever in that neck of the woods or at really any of our central or northern, central northern forest areas are pretty under surveyed, or the southwestern part of the state Lafayette County or Grant County

12:58:24 all could use more surveys if you're ever in that area and are able to get some observations.

12:58:41 We're all caught up.

12:58:44 I think we have, maybe two minutes but I know, I don't know if we want to wrap it up or? Yeah, I think we probably just want to thank everyone for coming. And we will double check the Q&A to make sure that we answered everything clearly and if not we'll send them out. And other than that we're just again very grateful to all of you for being such dedicated bumble bee brigade volunteers with us and that you are always welcome to reach out with questions. Yeah, I second that. Thanks for joining. And we will, like our previous webinar, will work to get this added to our website for you guys to be able to look through at a later date. And then just, you know, hopefully this is helpful. But, I'd appreciate feedback too if there are still certain things that you are really struggling with for ID. And we can help out with that. Okay. With that, thank you everybody. Have a good day.