Learning to use a Dichotomous Key

In this activity, students will use a simplified Dichotomous key designed to be used with hexagonal stickers provided to learn the basics on how Dichotomous keys function.

Each student or group of students will take a sticker stuck to an individual or cut out from the sheet. The students along with their group will work through the key to identify the specimen present on their sticker(s).

This key trades more traditional taxonomic language or markers of identification in favour of being easily understood and answered based on the visuals present in each sticker. Once this activity has been completed a few times, students should be able to transfer these skills to any key.

How to use a Dichotomous Key

Dichotomous keys work by using paired statements or questions about key features to slowly narrow down the species you are identifying.

For this key, we will use guiding questions to help direct the students.

- Read the first question.
- Look to see which answer best suits your bug.
- Go to the question that is paired with your answer.
- Repeat this with the next question you were directed to.
- Continue following your answers until the key provides you with a species (or genus) name.

If your students have issues with the Rhododendron leafhopper compare its shape to the Oak treehopper, they are similar shapes but the Oak treehopper has more typical looking wings.

Example...

Question	Answer
1. Does the bug have visible wings? (Tip: one bug has colourful red and teal wings folded around its body)	Yes..... Go to Question 7.
	No..... Go to Question 2.

Our Bug has visible wings, so we will go to our next question, which is question 7.

7. Does it have large mouth parts that look like pincers?	Yes.....
	No..... Go to Question 8.

Our Bug does not have large pincers, so we will continue to question 8.

Notice how if our bug does have large pincers there is no new question... this is where if our bug had pincers the dichotomous key would identify our bug as a Dobson Fly

8. Does it have large front arms that could be used for grabbing prey, thinner legs used for walking or no visible legs in the photo?	Grabbing Prey.....
	Walking legs or no visible legs in photo..... Go to Question 9.

Our Bug has legs used for walking, not grabbing prey, so we will continue to question 9.

9. Does it have a long neck?	Yes.....
	No..... Go to Question 10.

Our bug does not have a long neck, so we will continue to question 10.

10. Does it have a tail like a scorpion? (The tail isn't able to sting anyone, they use it to impress others of their species just like peacocks do with their tails!)	Yes.....
	No..... Go to Question 11.

Our bug does not have a tail that looks like a scorpion, so we will continue to question 11.

11. Does it have a thin shiny blue body?	Yes.....
	No..... Go to Question 12.

Our bug is green, not blue, so we will continue to question 12.

12. Does it have translucent wings (would you be able to see something through the wings)?	Yes..... Go to Question 13.
	No..... Go to Question 19.

It's hard to tell in this picture, but our bug does have see-through wings, so we will go to question 13. See below some more clear pictures of see-through wings.

13. Does It have one or more yellow stripes on its abdomen (butt)?	Yes..... Go to Question 14.
	No..... Go to Question 16.

Our bug does not have yellow stripes on its abdomen so we will continue to Question 16

16. Does it have a large non antenna structure attached at its head?	Yes..... Go to Question 17.
	No..... Go to Question 18.

The only structures coming out of our bugs' head are antennae, so we will go to question 18.

18. Is it green or yellow?	Green .....
	Yellow.....

Our bug is green, so the key tells us that our bug is part of the Augochlora family, better known by their common name of the Green Sweat Bee!

Your teacher has been given an answer key so you can confirm that you got the right answer

Question	Answer	Identification	common name
1. Does the bug have visible wings? (Tip: one bug has colourful red and teal wings folded around its body)	Yes..... Go to Question 7.		
	No..... Go to Question 2.		
2. Does the bug have hard wing covers (elytra)?	Yes..... Go to Question 4.		
	No..... Go to Question 3.		
3. Is the bug long and thin or round?	Long and thin.....	Diapheromera femorata	Common walkingstick
	Round.....	Acanthepeira stellata	starbellied spider
4. Is the picture from above (dorsal) or the side (lateral)	Above (dorsal)..... Go to Question 5		
	Side (lateral)..... Go to Question 6		
5. What kind of colour and pattern does it's wing covers (elytra) have?	All Dark Green.....	Carabus truncaticollis	Carabidae
	Bright Green With Small Yellow Spots.....	Cicindela sexguttata	six-spotted green tiger beetle
	Black and Orange Zig Zags.....	Nicrophorus vespilloides	burying beetle
6. What colour is it?	Green	Polydrusus formosa	green immigrant leaf weevil
	Brown.....	Lignyodes helvolus	seed weevil
7. Does it have large mouth parts that look like pincers?	Yes.....	Corydalus cornutus	dobsonfly
	No..... Go to Question 8.		
8. Does it have large front arms that could be used for grabbing prey, thinner legs used for walking or no visible legs in the photo?	Grabbing Prey.....	Mantis religiosa	
	Walking legs or no visible legs in photo..... Go to Question 9.		
9. Does it have a long neck?	Yes.....	Agulla bicolor	snakefly
	No..... Go to Question 10.		
10. Does it have a tail like a scorpion? (The tail isn't able to sting anyone, they use it to impress others of their species just like peacocks do with their tails!)	Yes.....	Panorpa debilis	scorpionfly
	No..... Go to Question 11.		
11. Does it have a thin shiny blue body?	Yes.....	Enallagma	damselflies
	No..... Go to Question 12.		
12. Does it have translucent wings (would you be able to see something through the wings)?	Yes..... Go to Question 13.		
	No..... Go to Question 19.		
13. Does It have one or more yellow stipes on its abdomen (butt)?	Yes..... Go to Question 14.		
	No..... Go to Question 16.		
14. Does it have a green thorax (chest)?	Yes.....	Agapostemon virescens	striped sweat bee
	No..... Go to Question 15.		
15. Does its antenna come from seperate sides of it head or come out of the front before splitting?	Opposite sides of head.....	Hemaris diffinis	Snowberry clearwing
	Front of head.....	Stratiomys barbata	soldier fly
16. Does it have a large non antena structure attached at its head?	Yes..... Go to Question 17.		
	No..... Go to Question 18.		
17. Does the structure stick forwards like a horn or Go backwards toward the abdomen (body)?	Forwards.....	Platycotis vittata	oak treehopper
	Backwards.....	Stictocephala bisonia	Buffalo treehopper
18. Is it green or yellow?	Green	Augochlora	Green Sweat Bee
	Yellow.....	Poecilanthrax sackenii	Large Bee Fly
19. What colour are its wings?	Green	Actias Luna	Luna Moth
	Yellow and Pink.....	Dryocampa rubicunda	Rosy maple moth
	Red and Teal.....	Graphocephala fennahi	Rhododendron leafhopper
	Beige.....	Nadata gibbosa	rough prominent, moth
	Orange.....	PolyGonia comma	eastern comma

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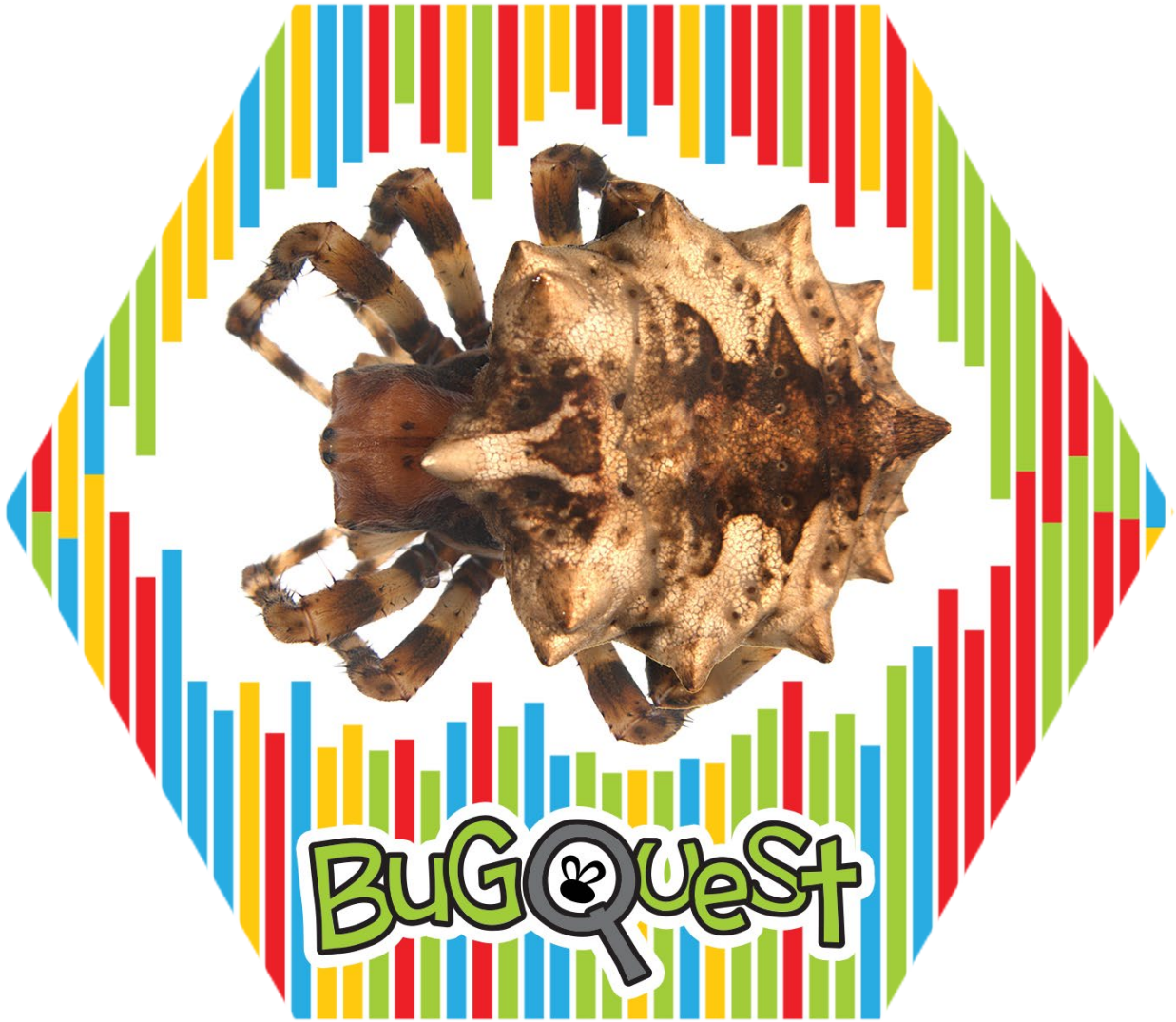
DNA barcode 'em all!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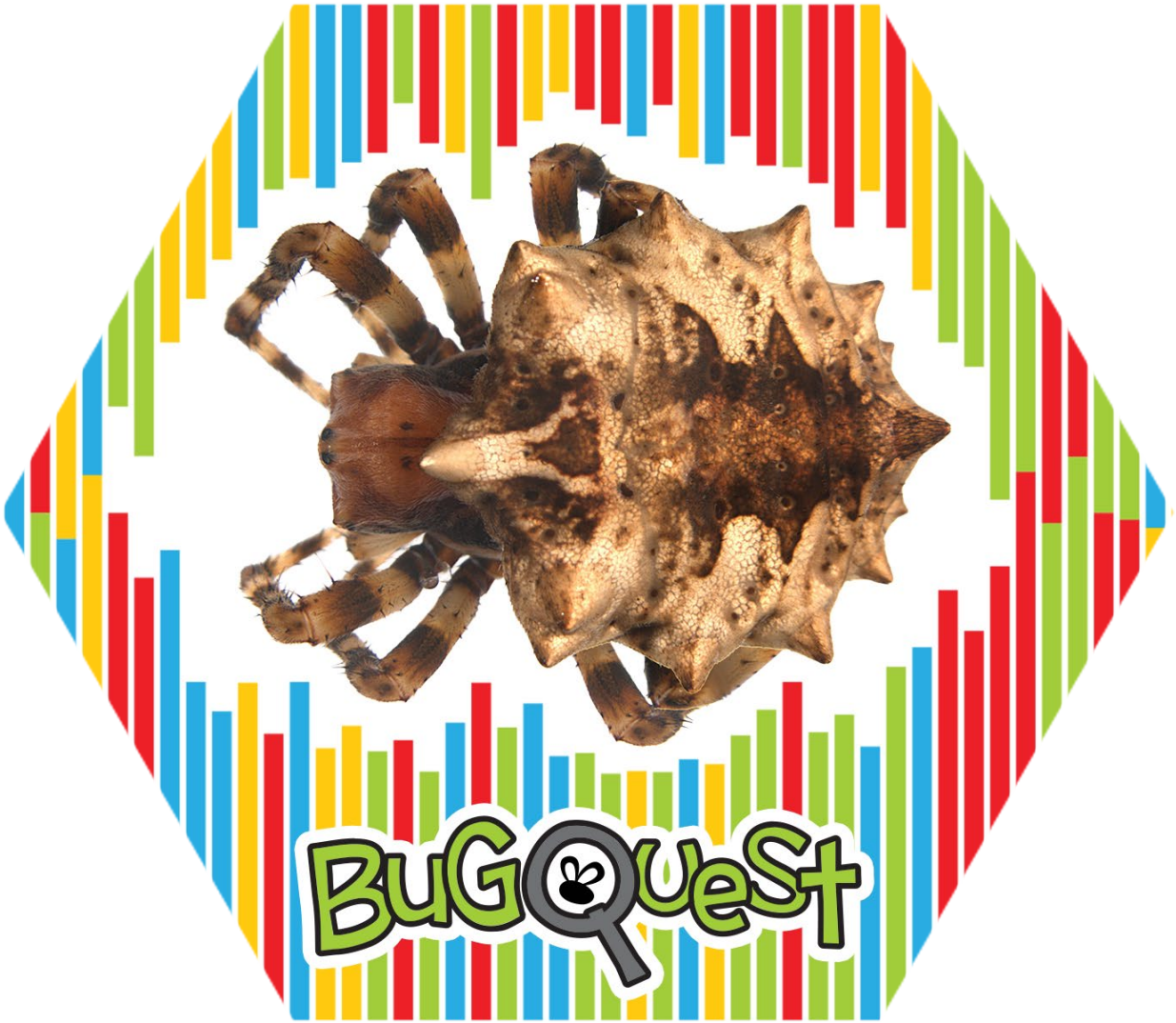
Acanthepeira stellata



Starbellied Spider

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Actias Luna

Luna Moth

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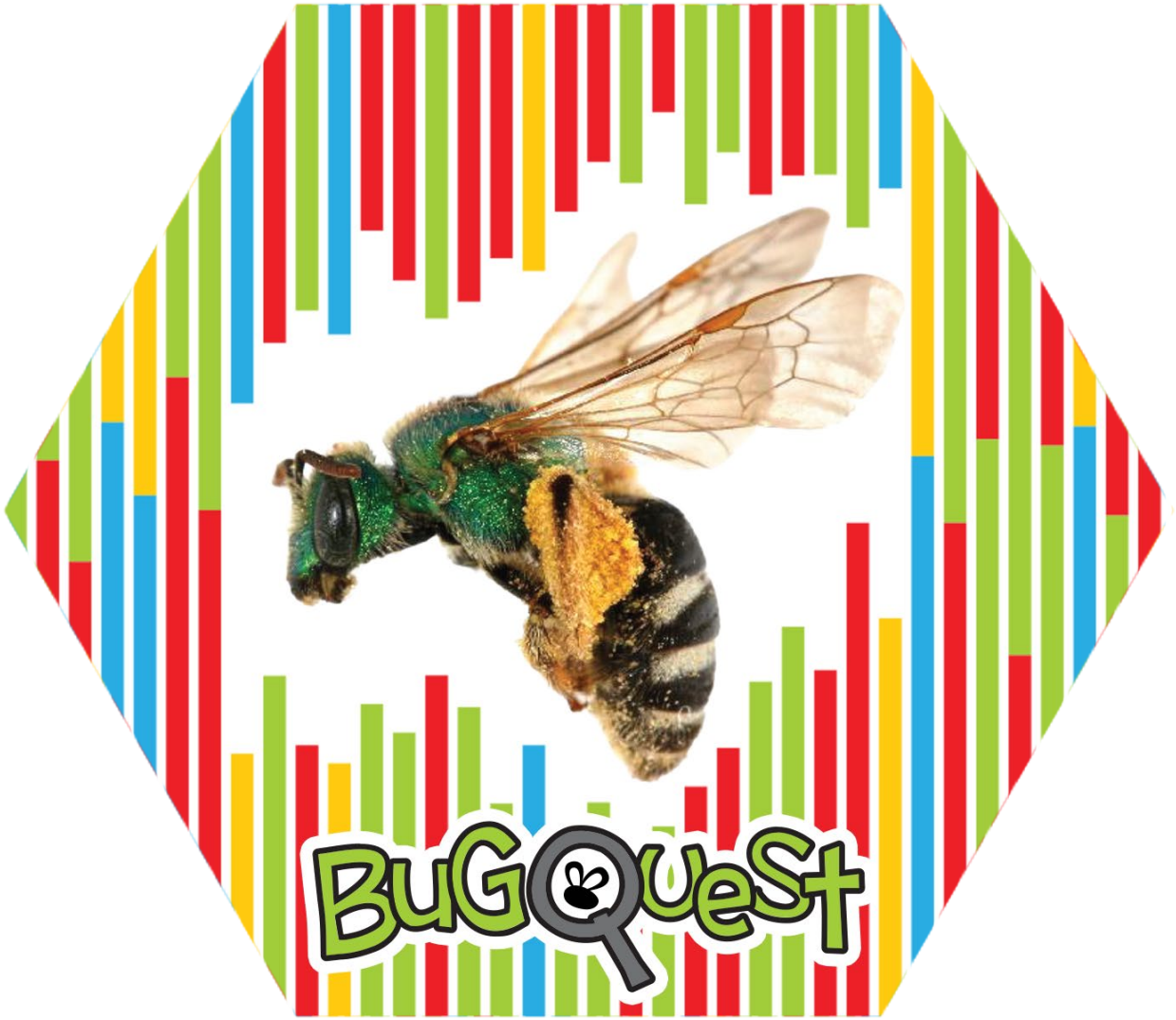
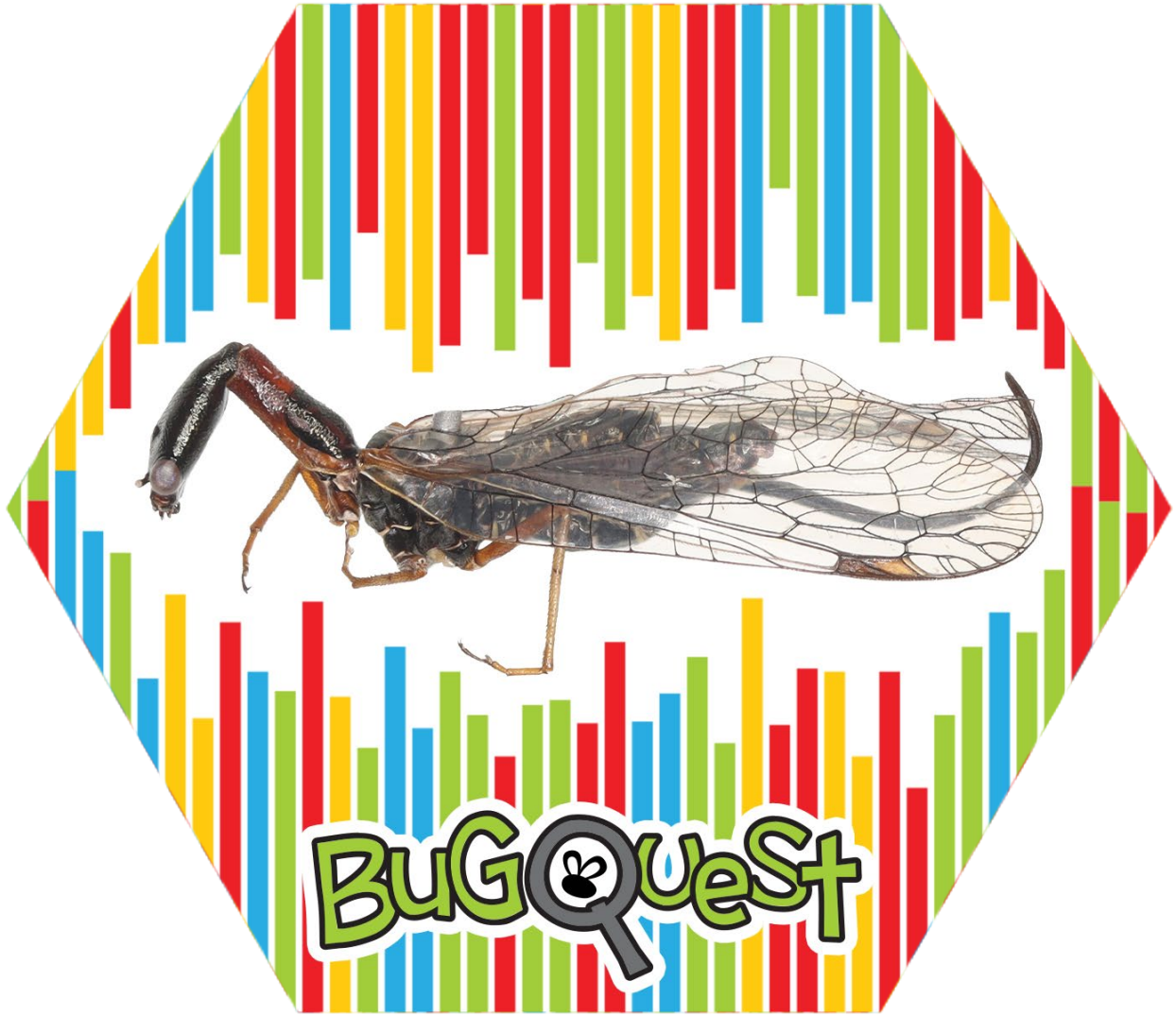
Agapostemon virescens



Striped Sweat Bee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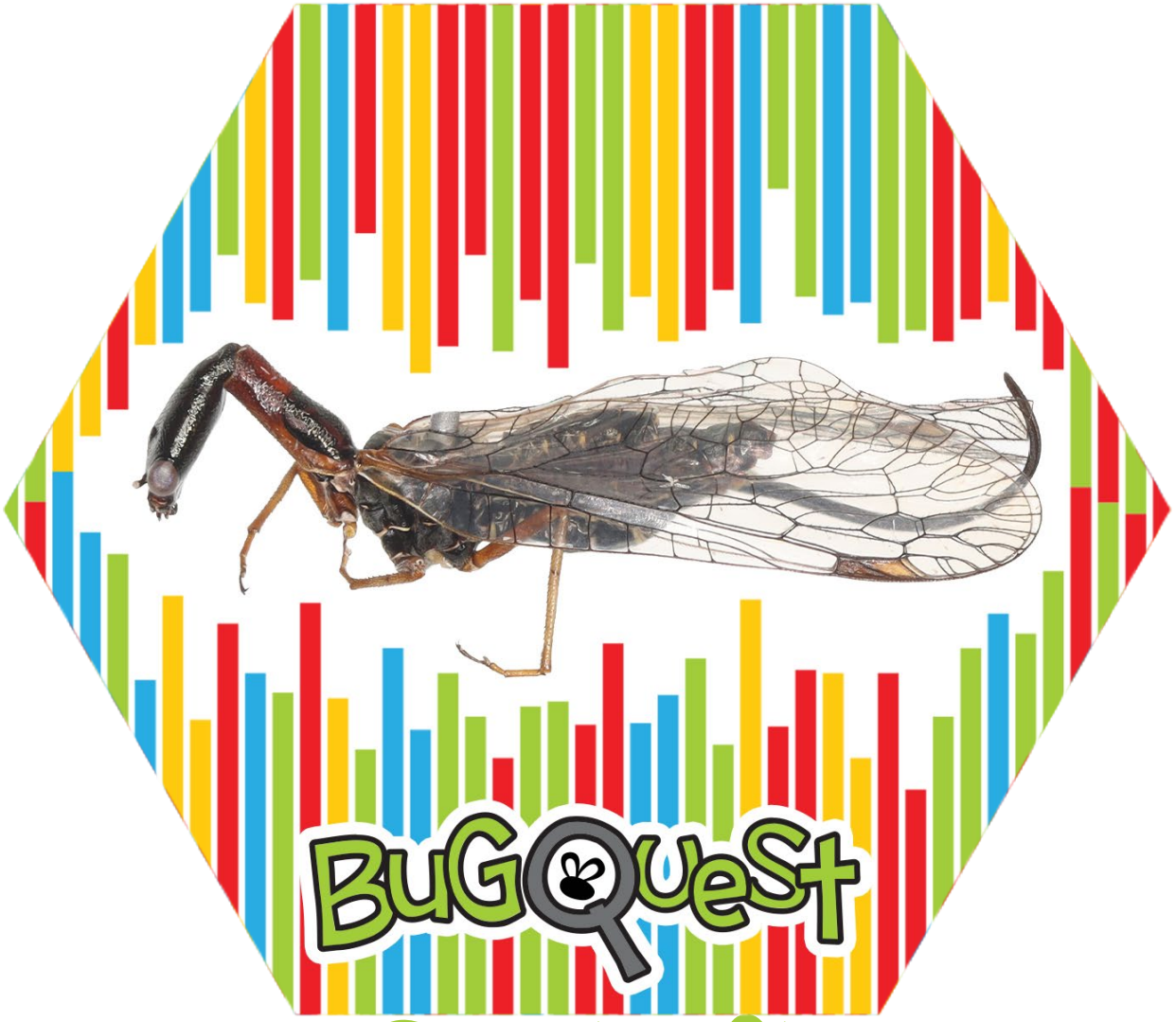
Agulla Bicolor



Snakefly

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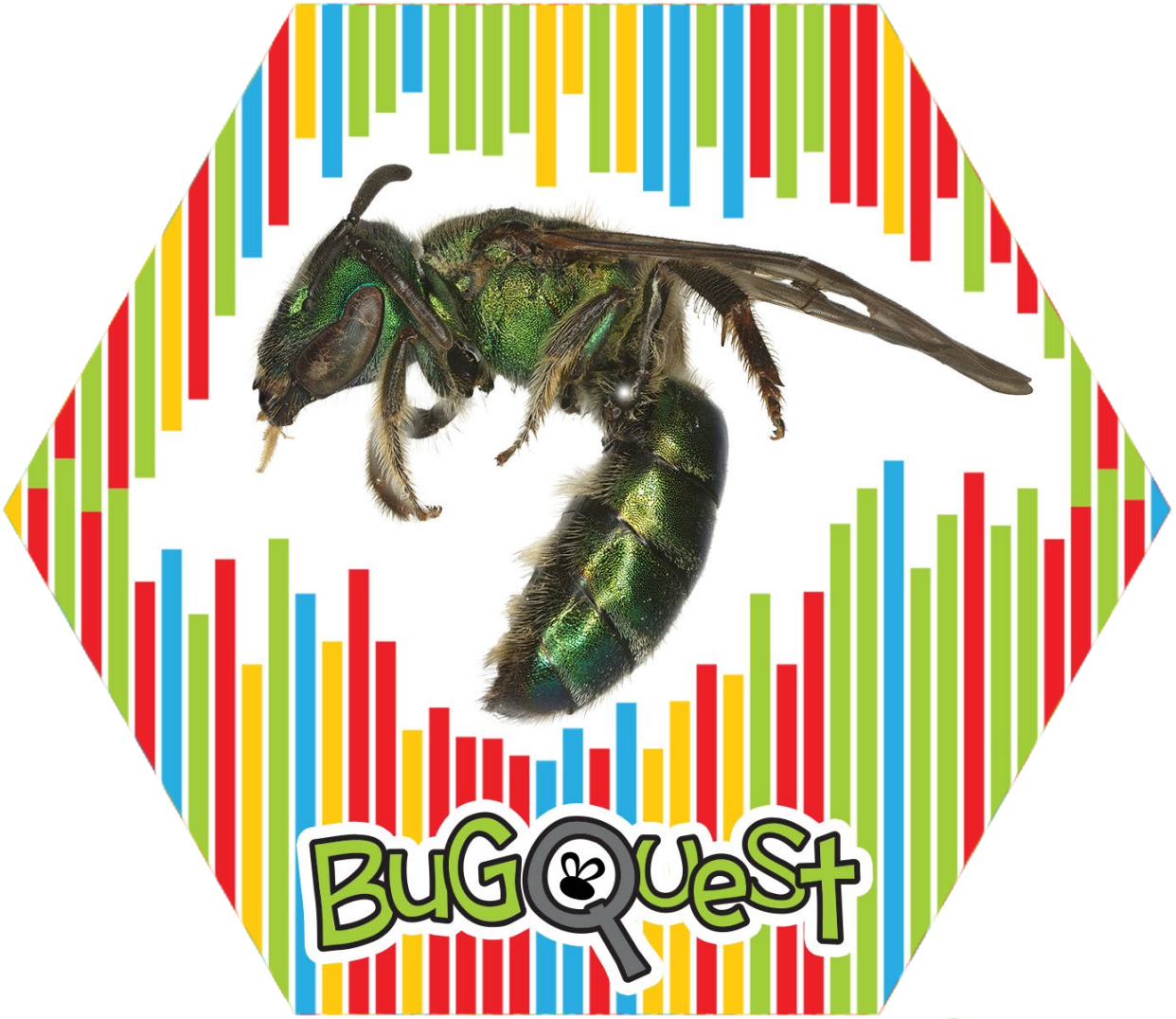
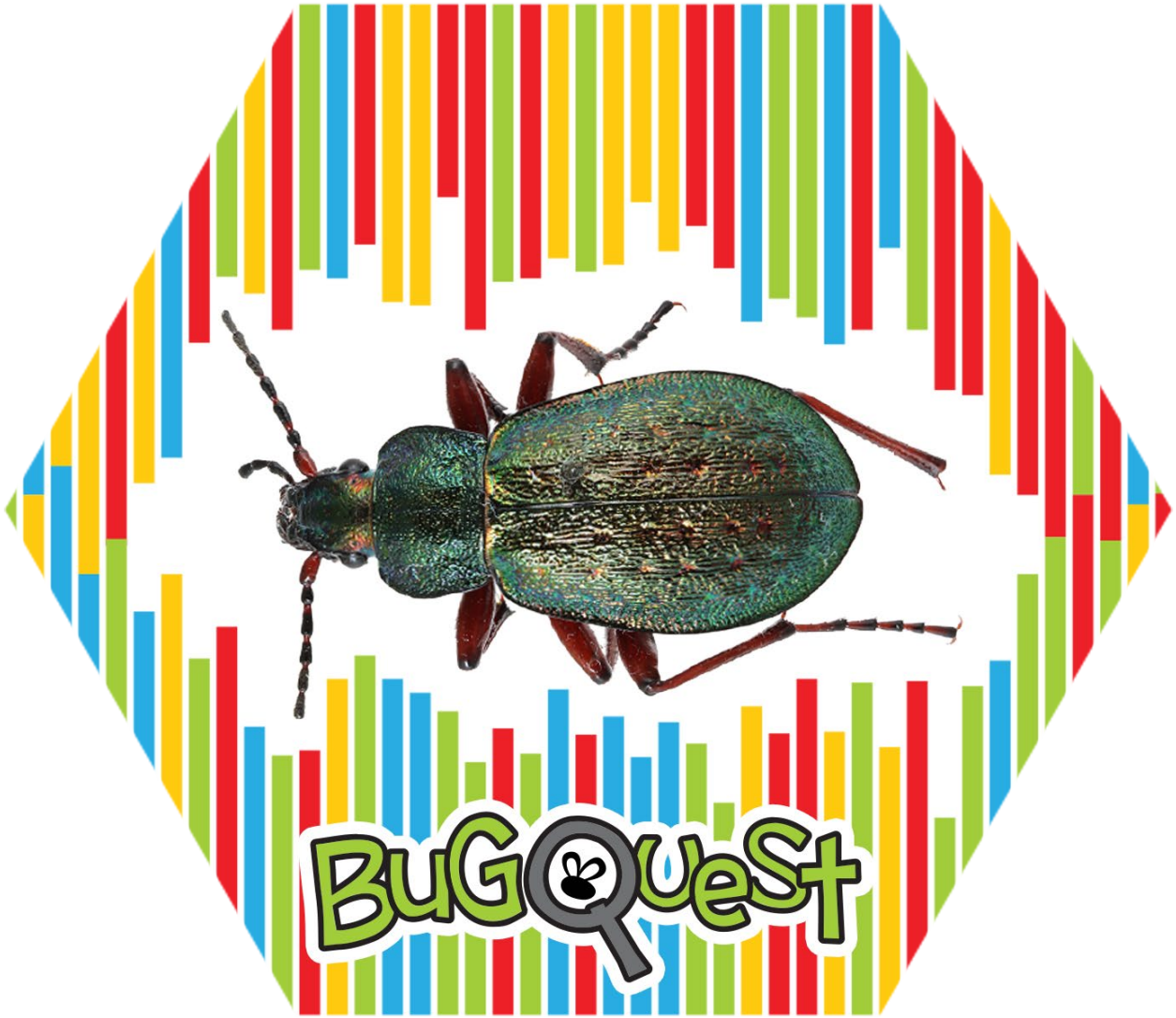
Augochlora



Green Sweat Bee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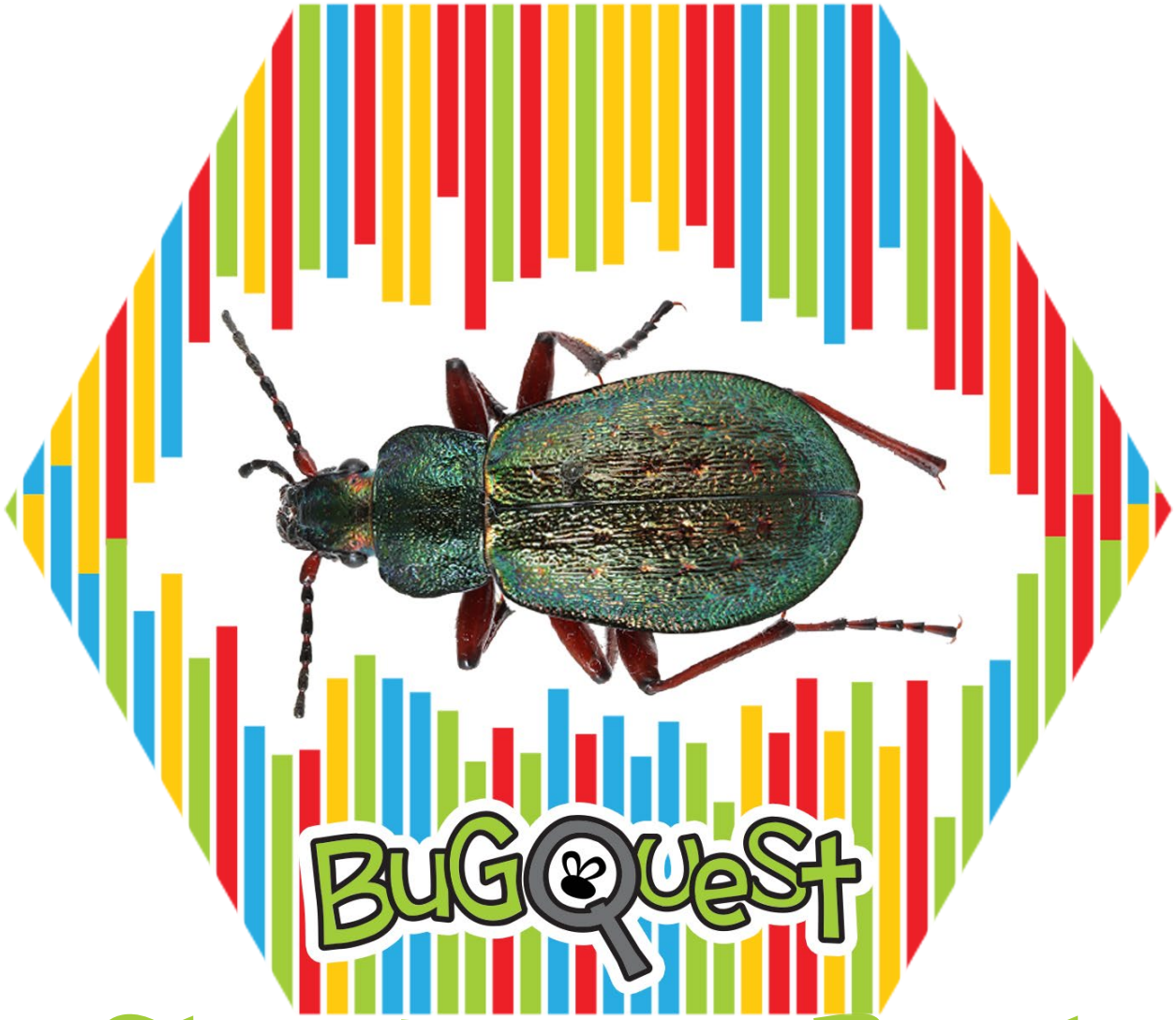
Carabus Truncaticollis



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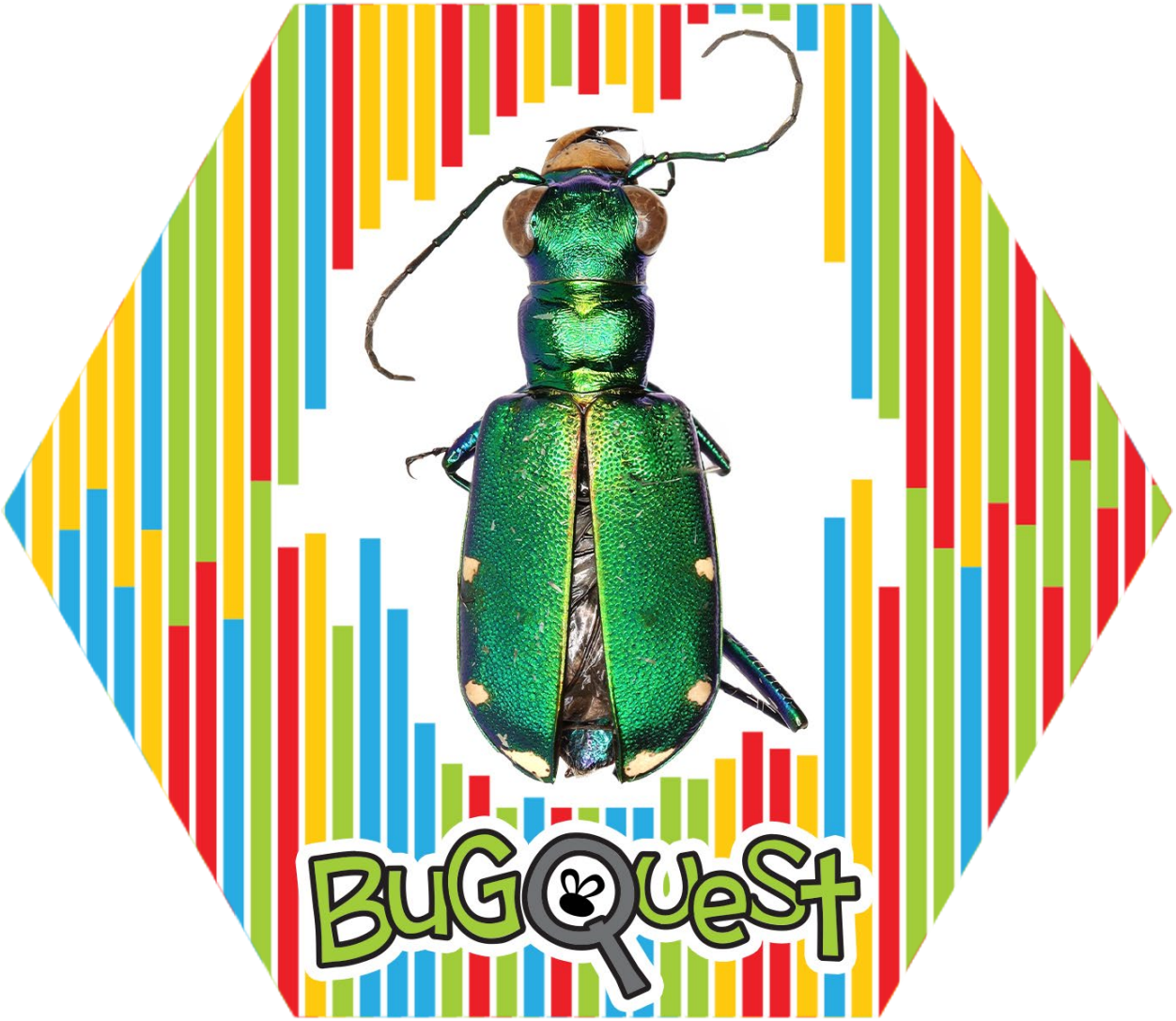
Slug Hunter Beetle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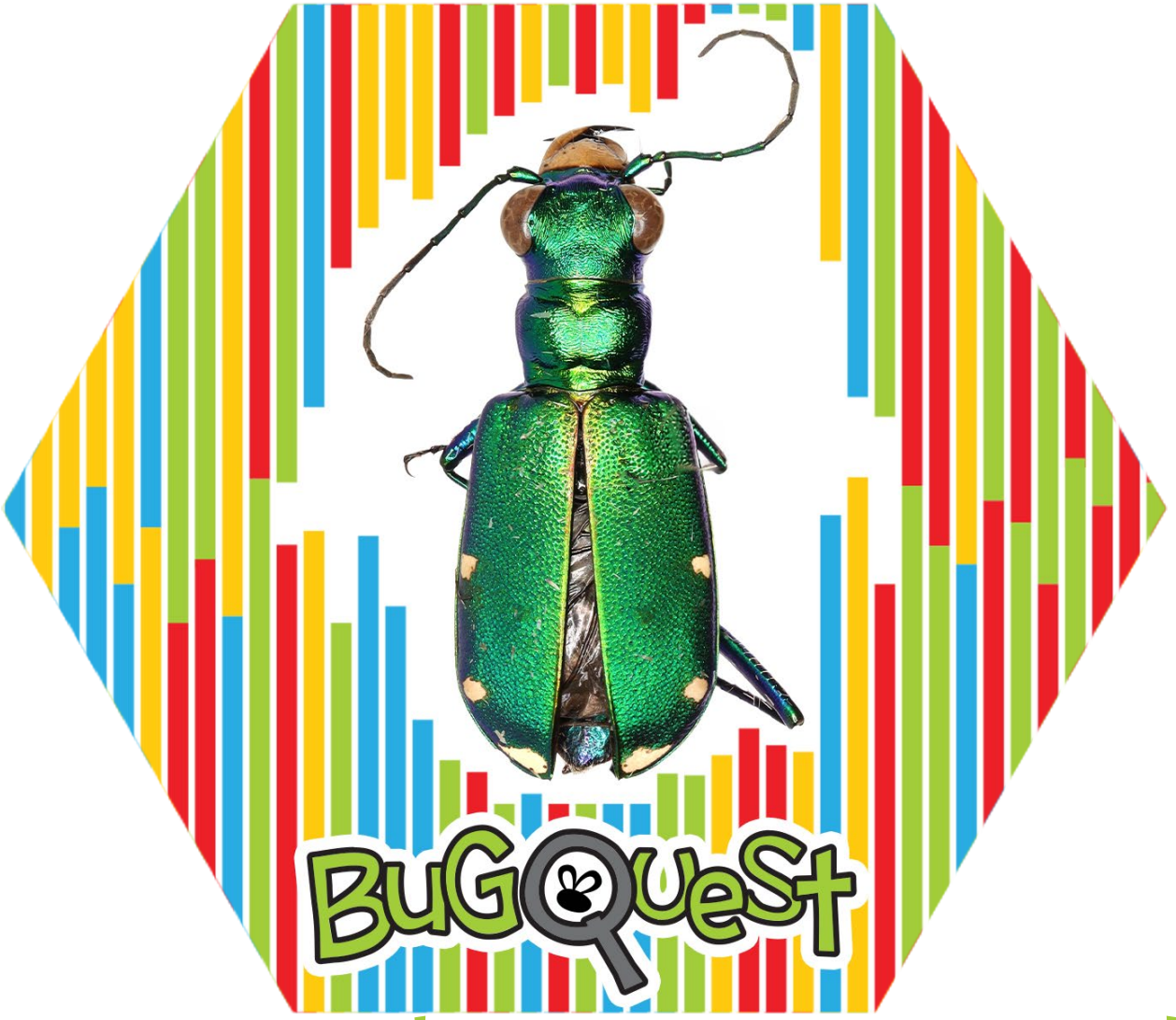
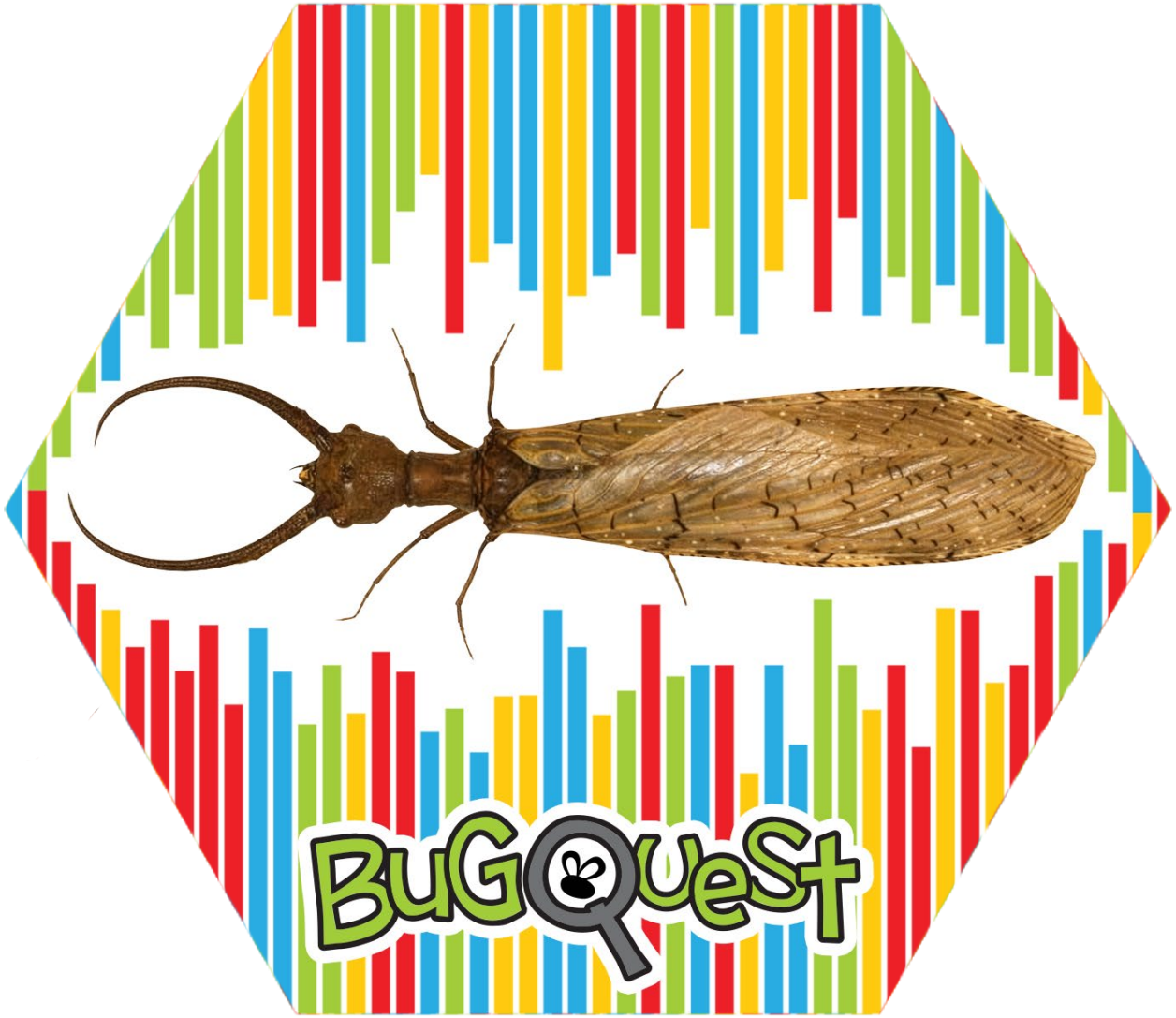
Cicindela sexguttata



Six-spotted green tiger beetle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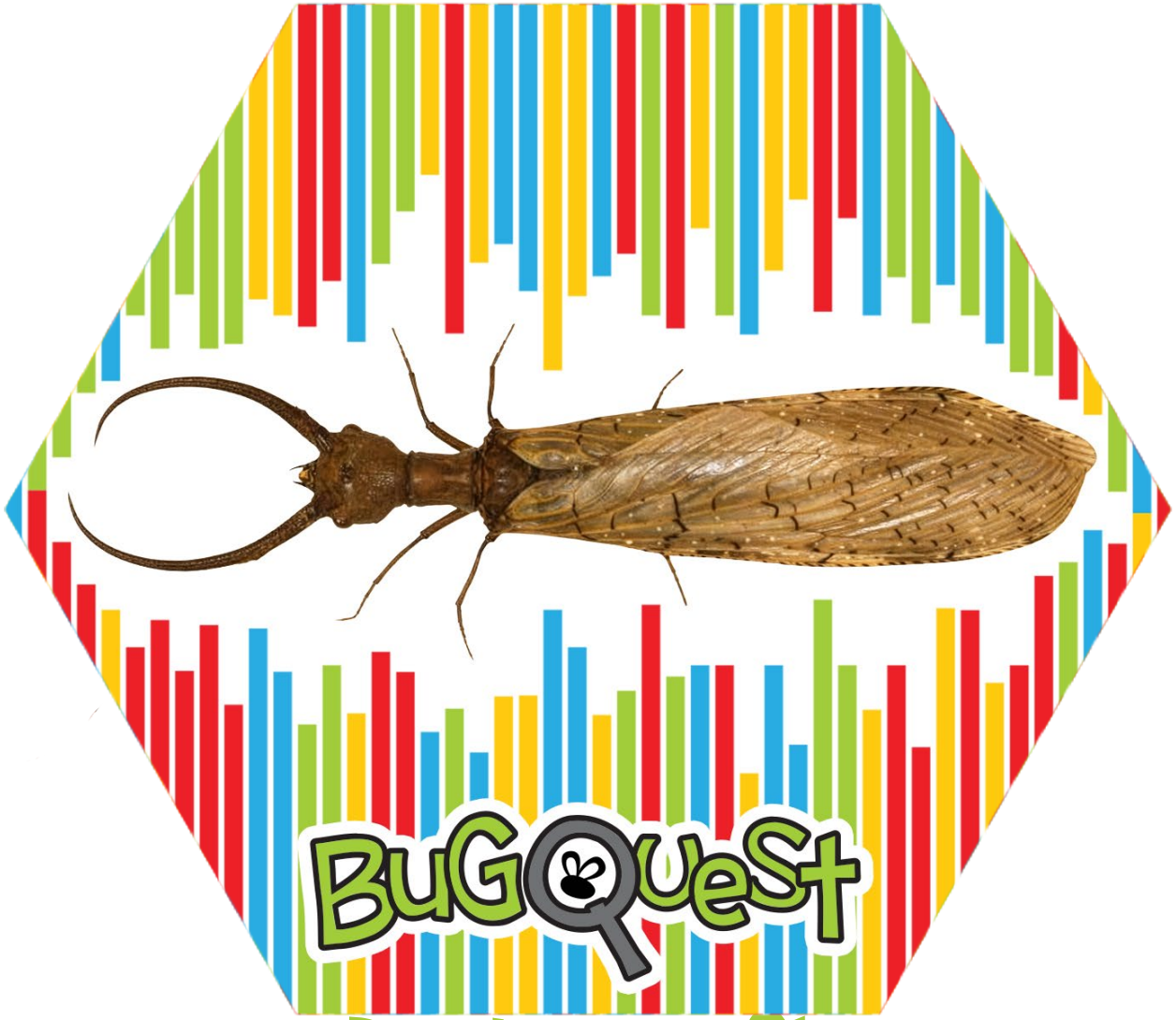
Corydalus cornutus



Dobsonfly

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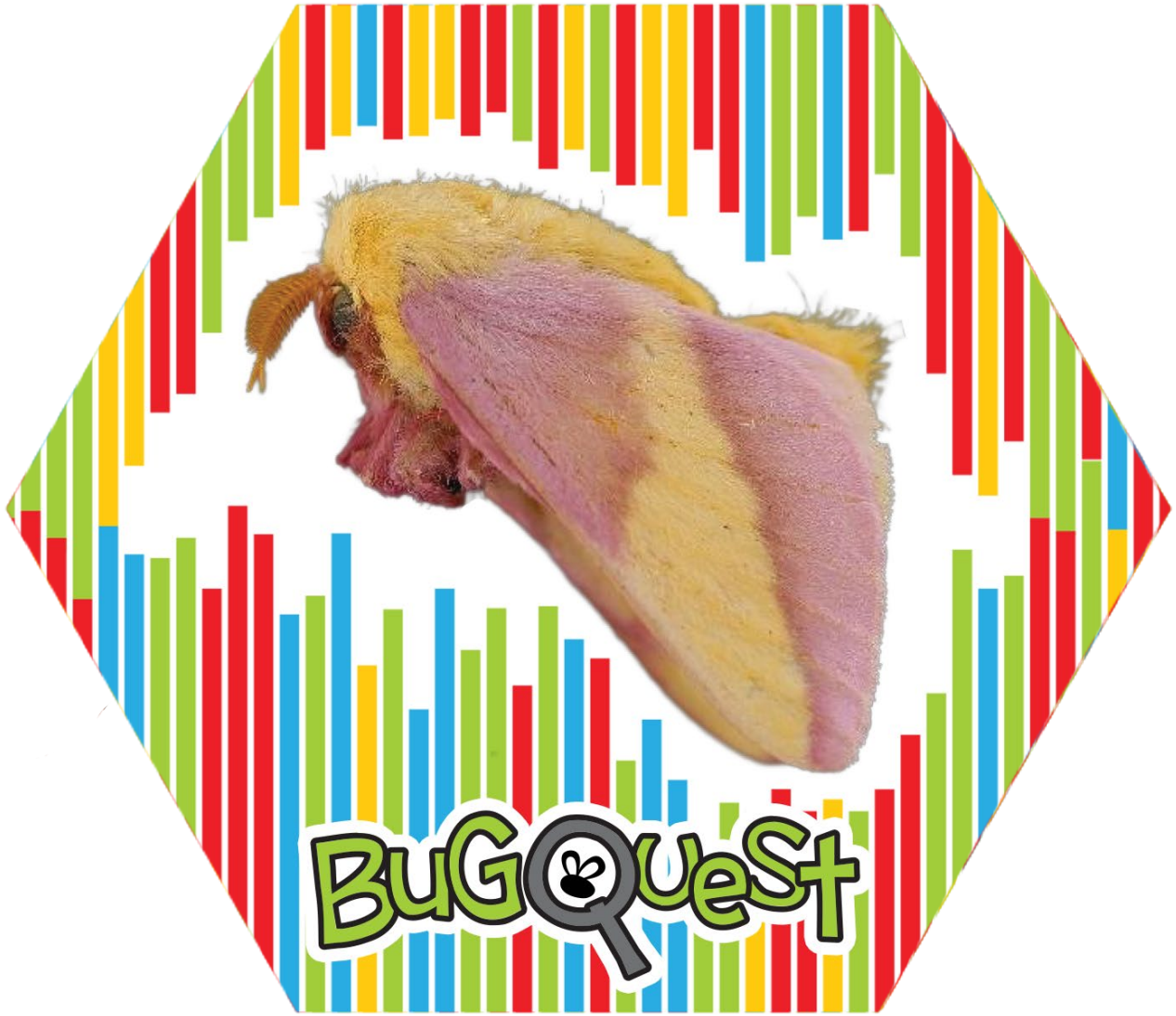
Diapheromera femorata

Common walkingstick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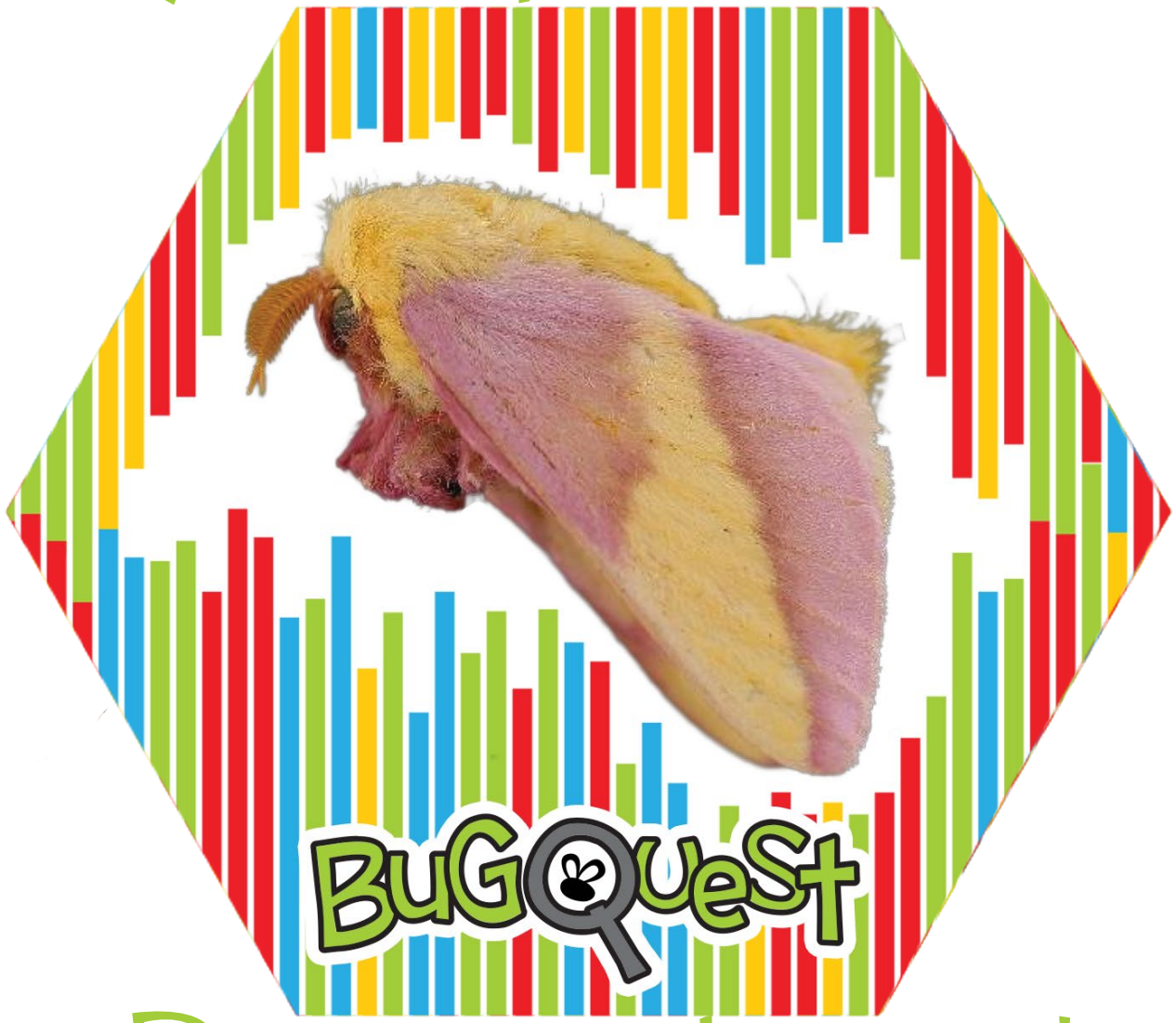
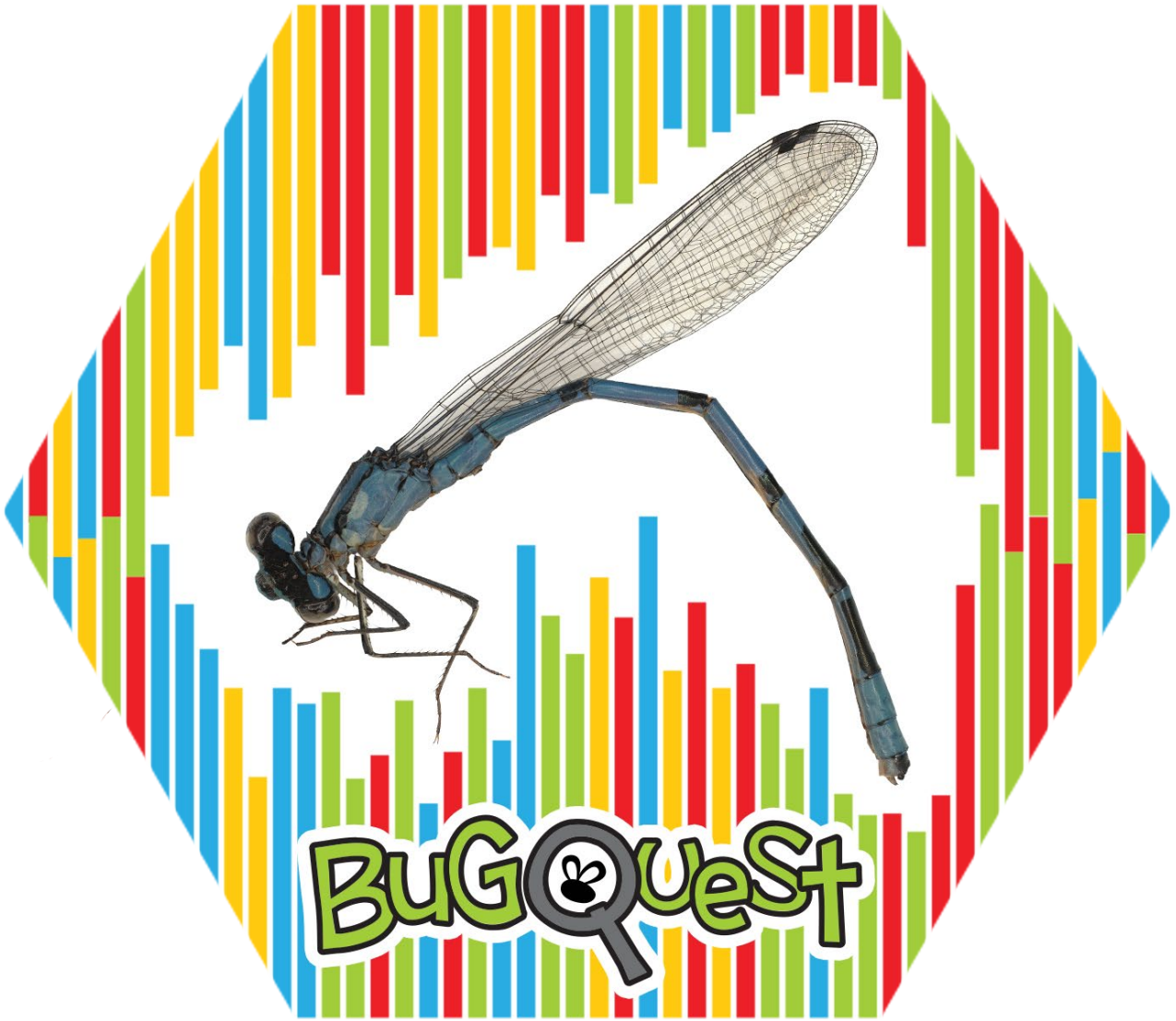
Dryocampa rubicunda



Rosy maple moth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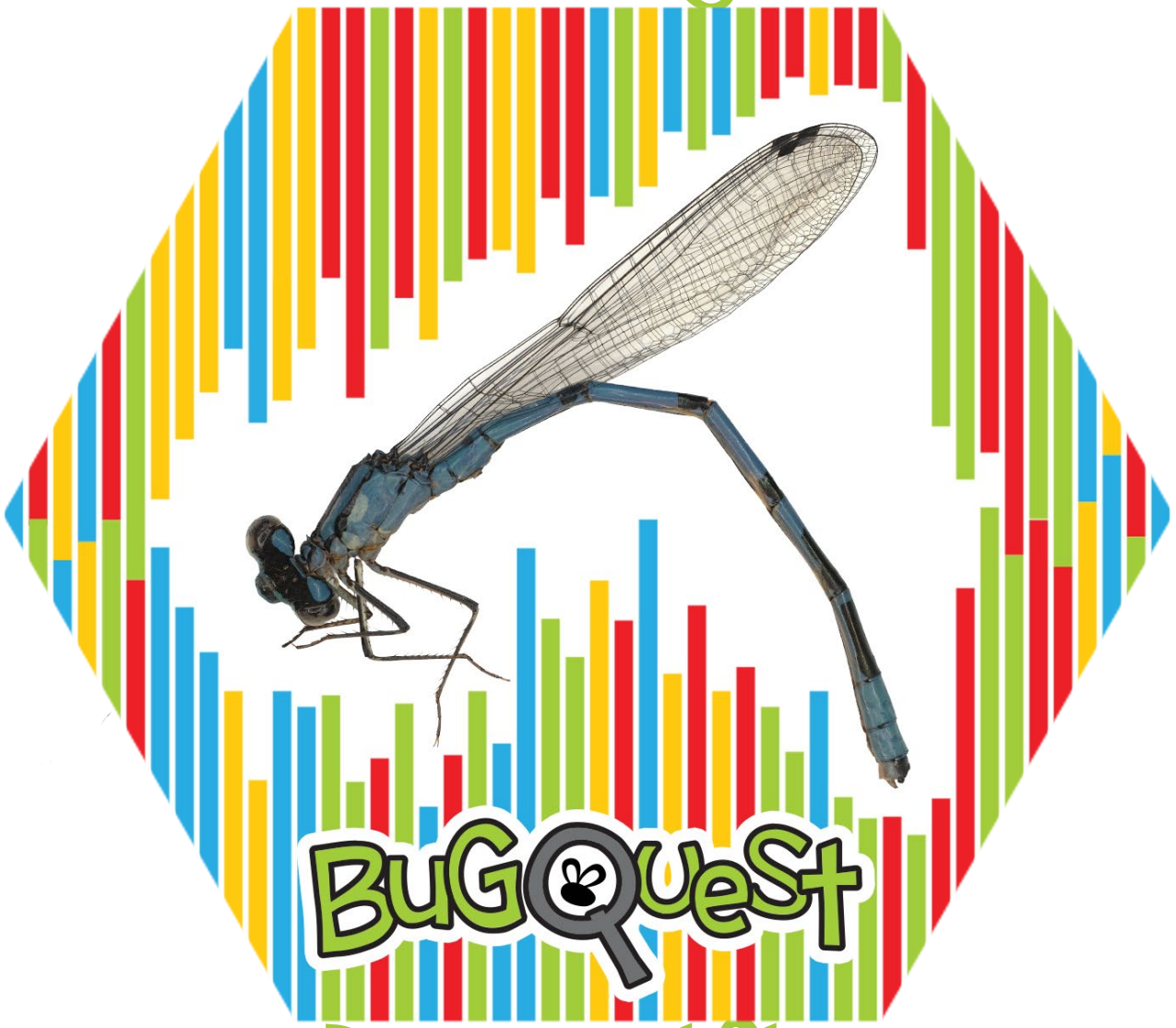
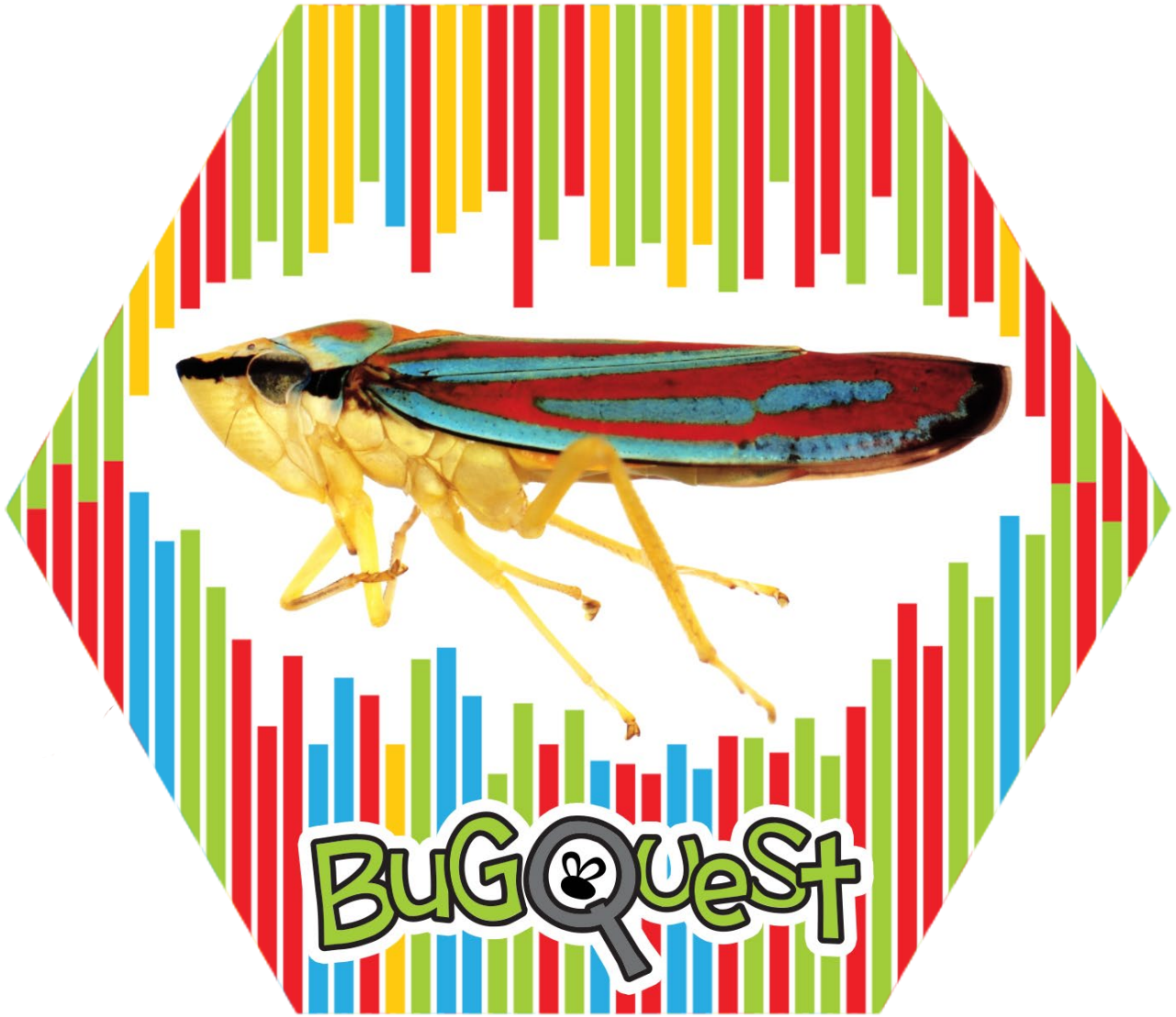
Enallagma



Damselflies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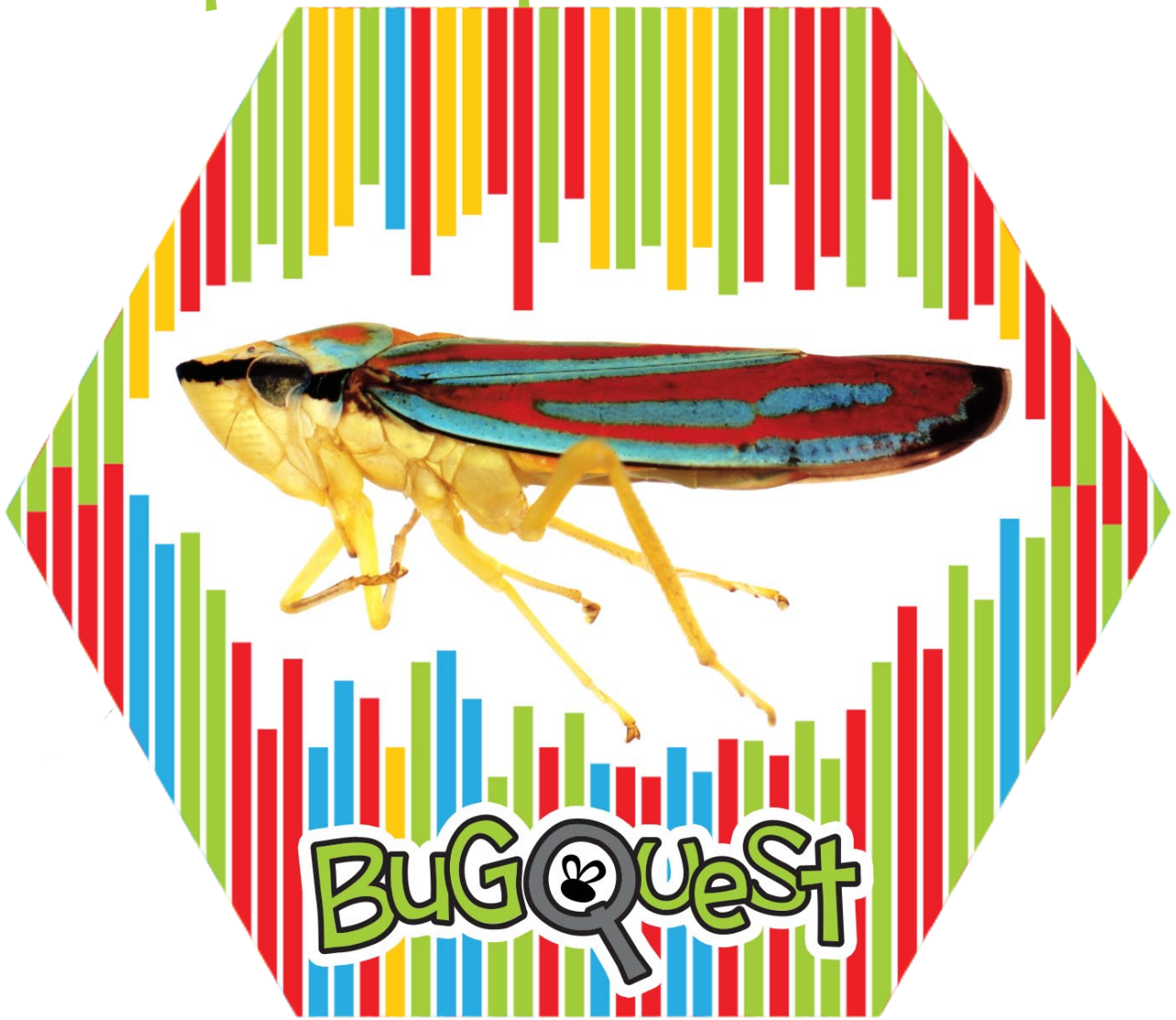
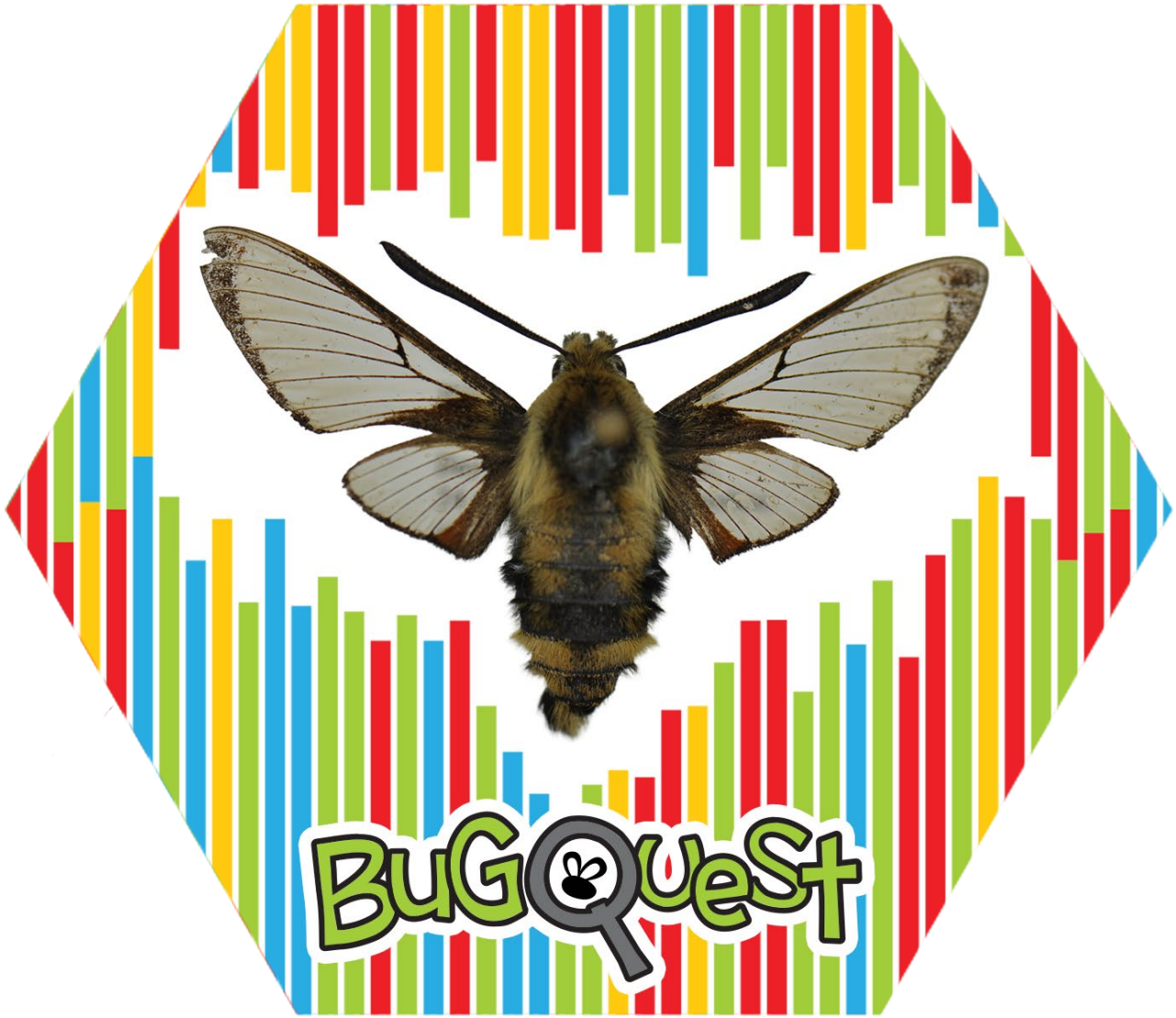
Graphocephala fennahi



Rhododendron leafhopper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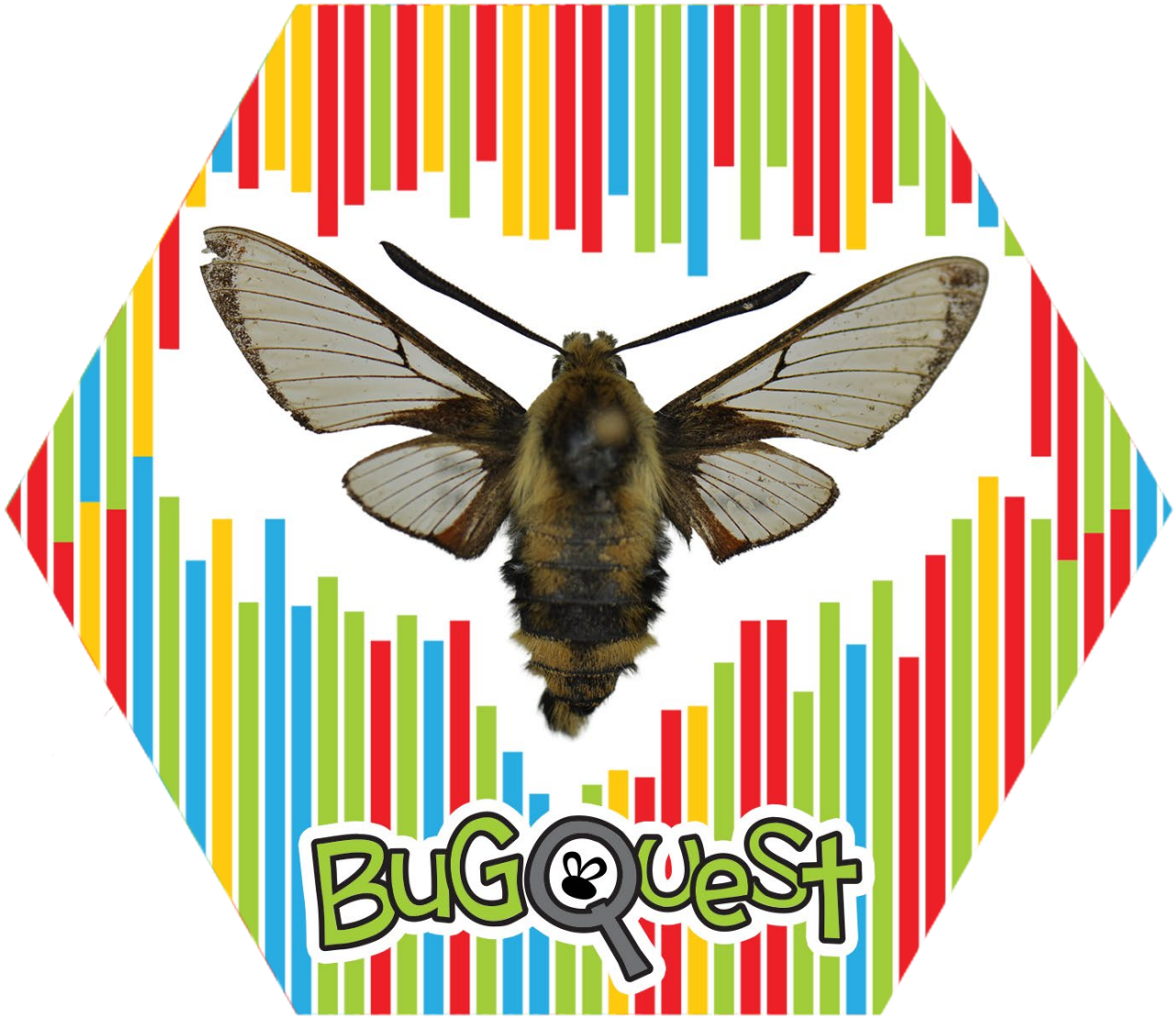
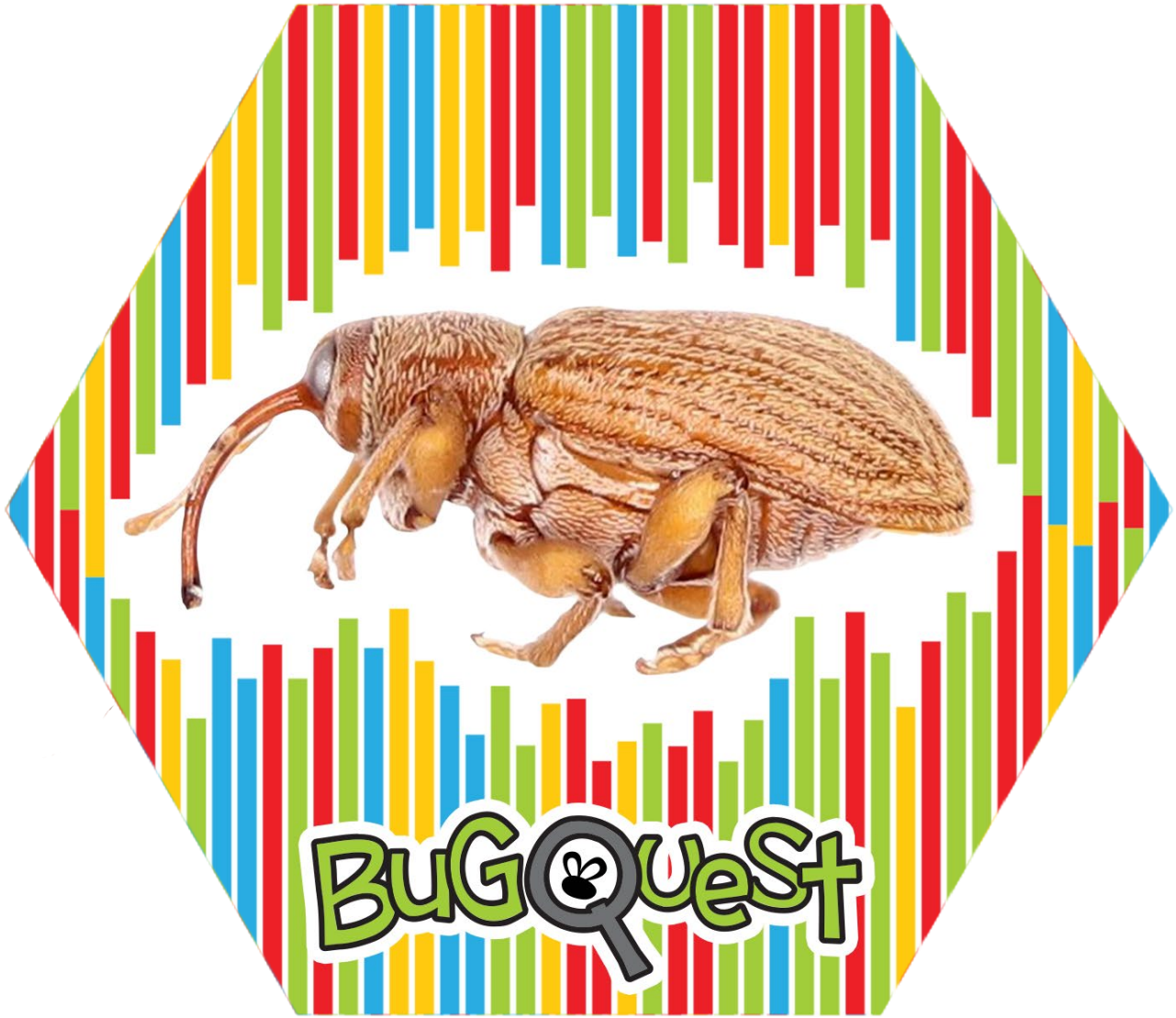
Hemaris diffinis



Snowberry clearwing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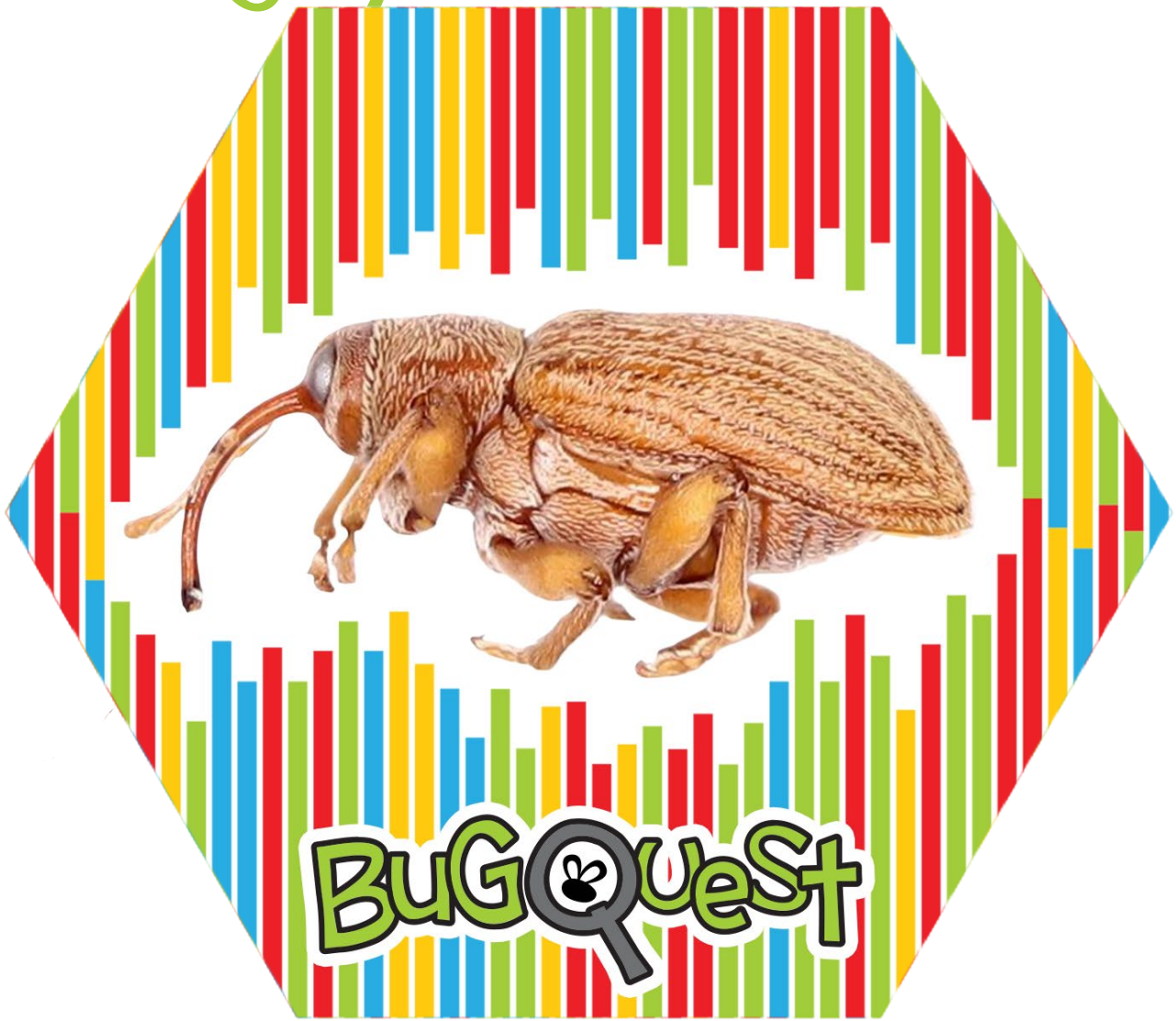
Lignyodes helvolus



Seed weevil

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Mantis religiosa

European Mantis

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Nadata gibbosa

Rough prominent moth

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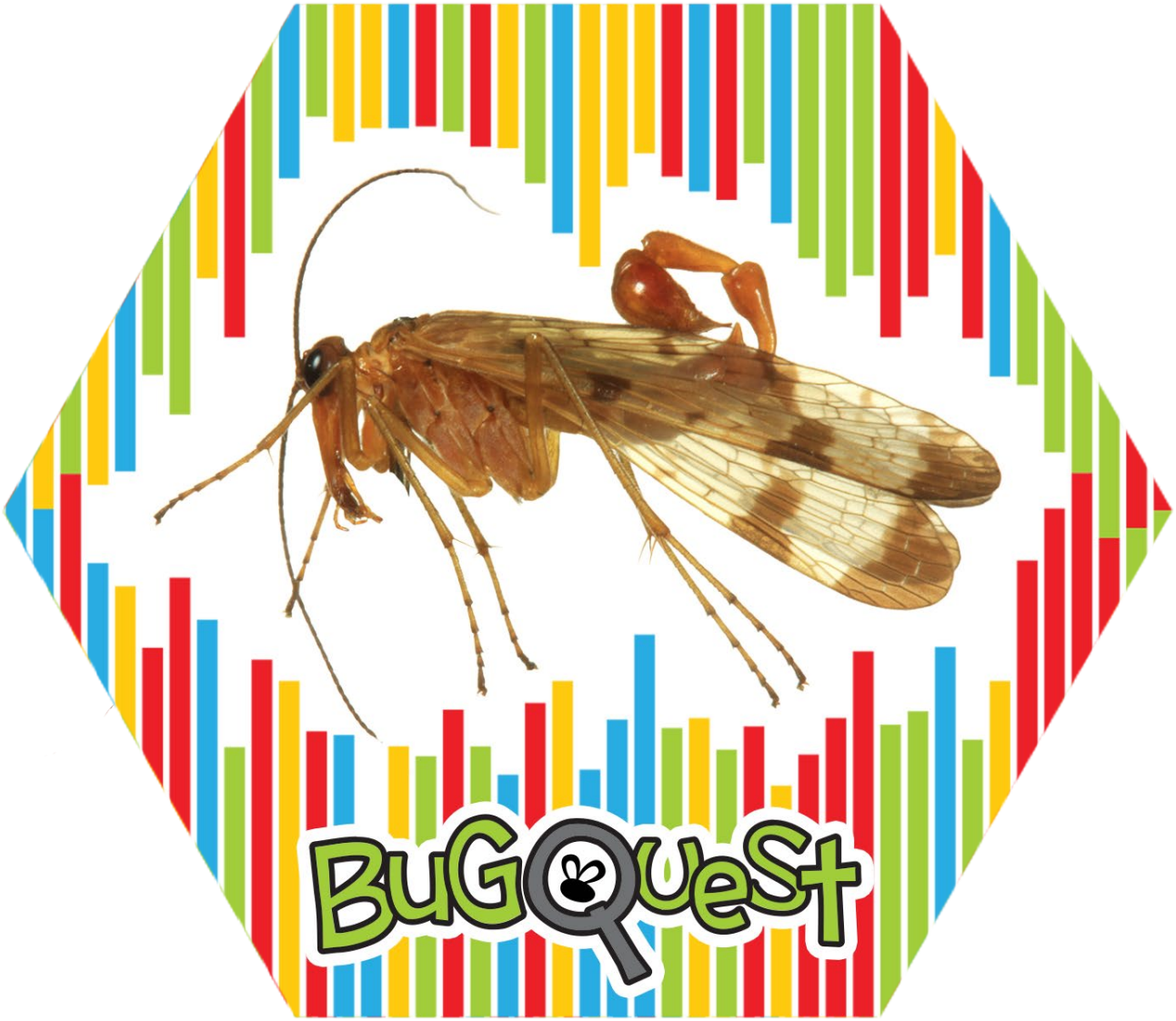
Nicrophorus vespilloides

Buring beetle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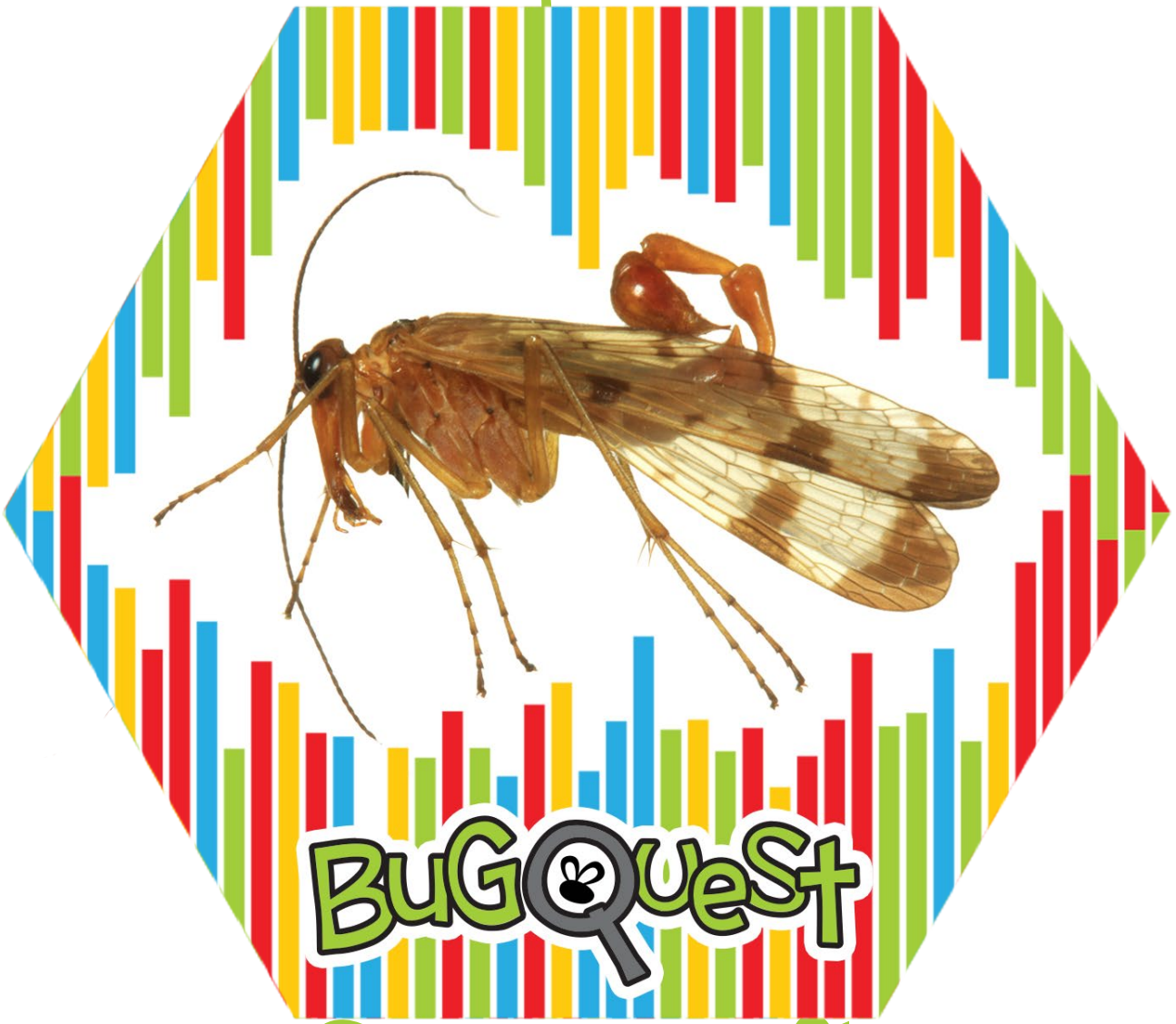
Panorpa debilis



Scorpionfly

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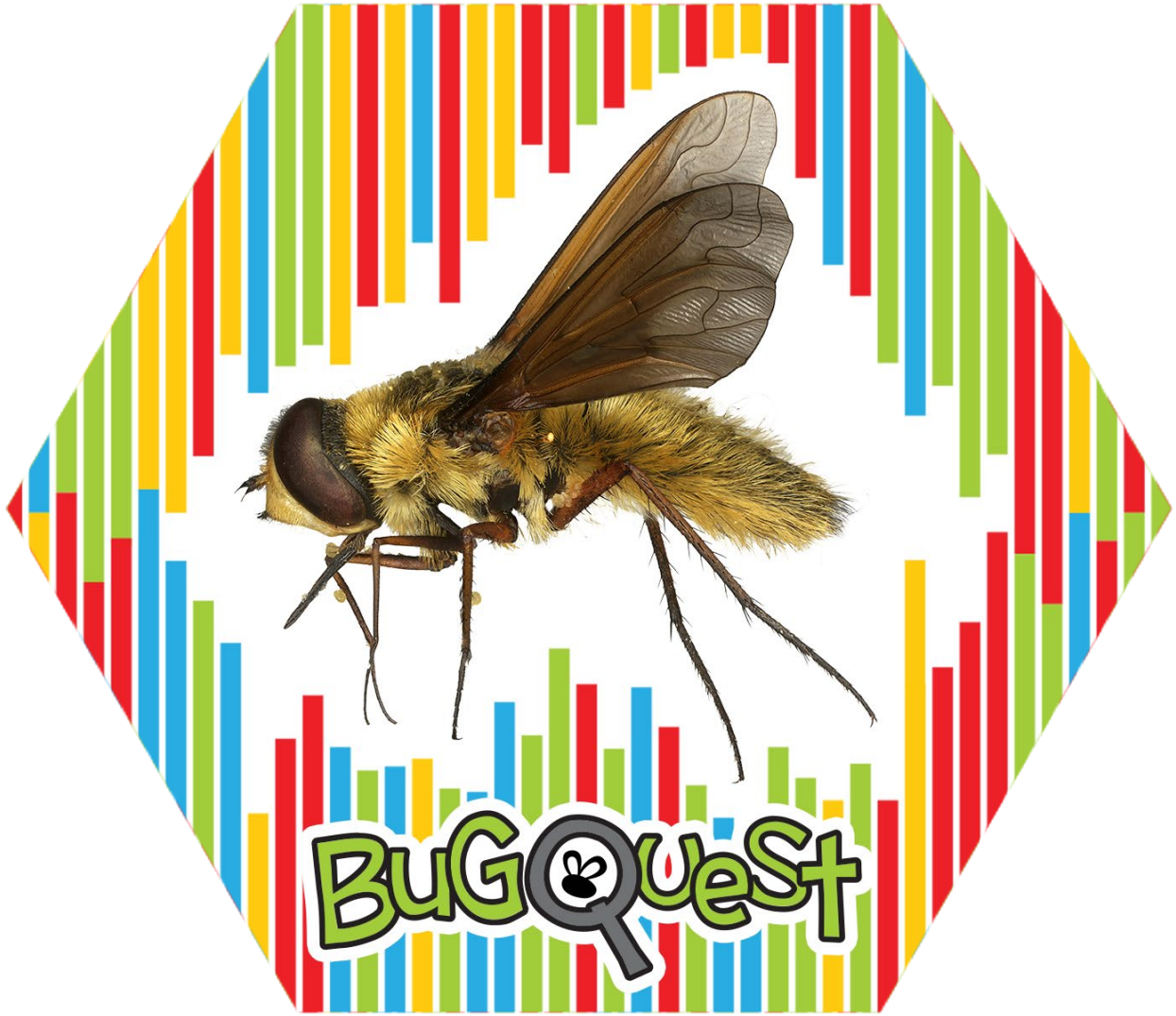
Platycotis vittata

Oak treehopper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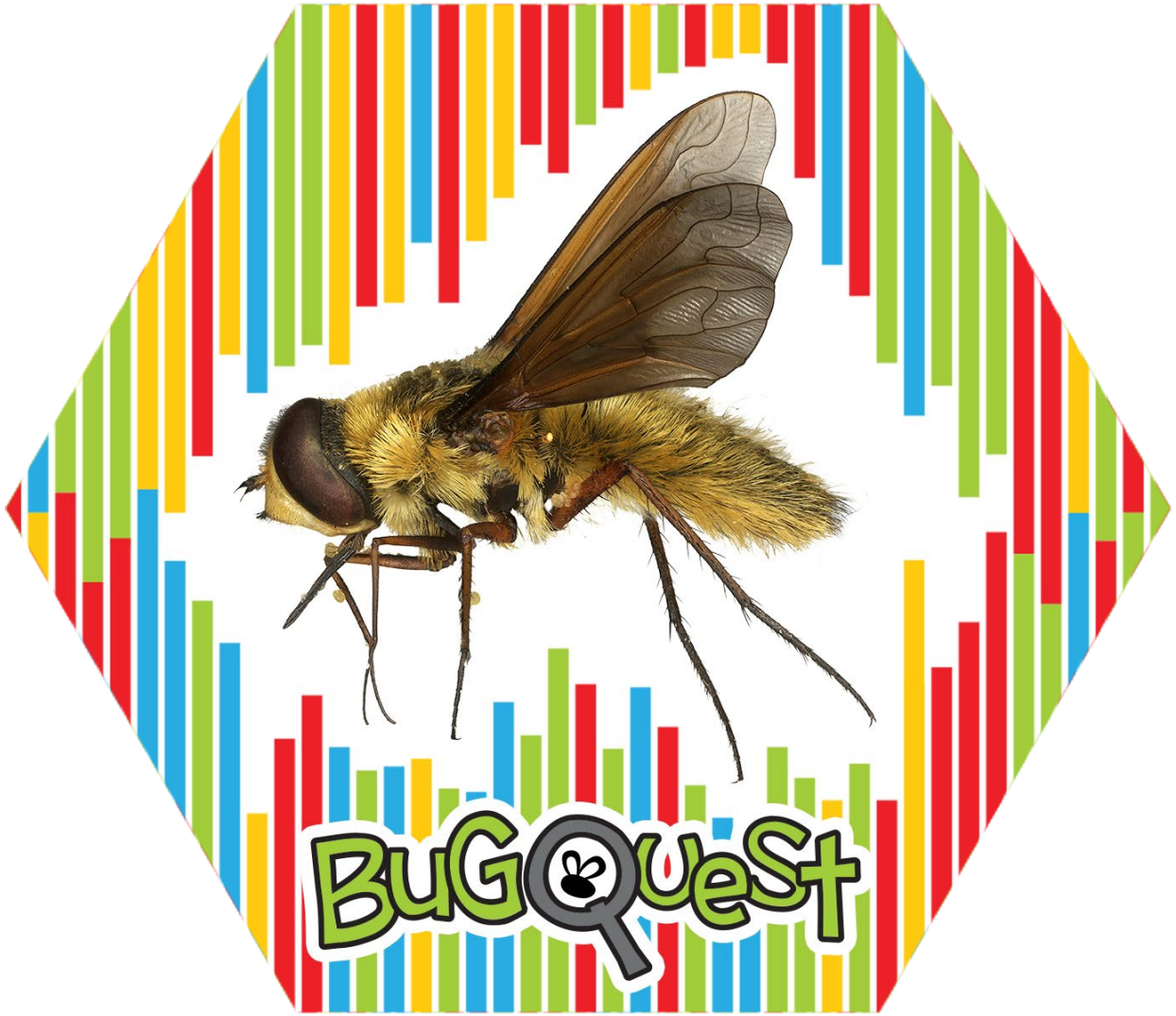
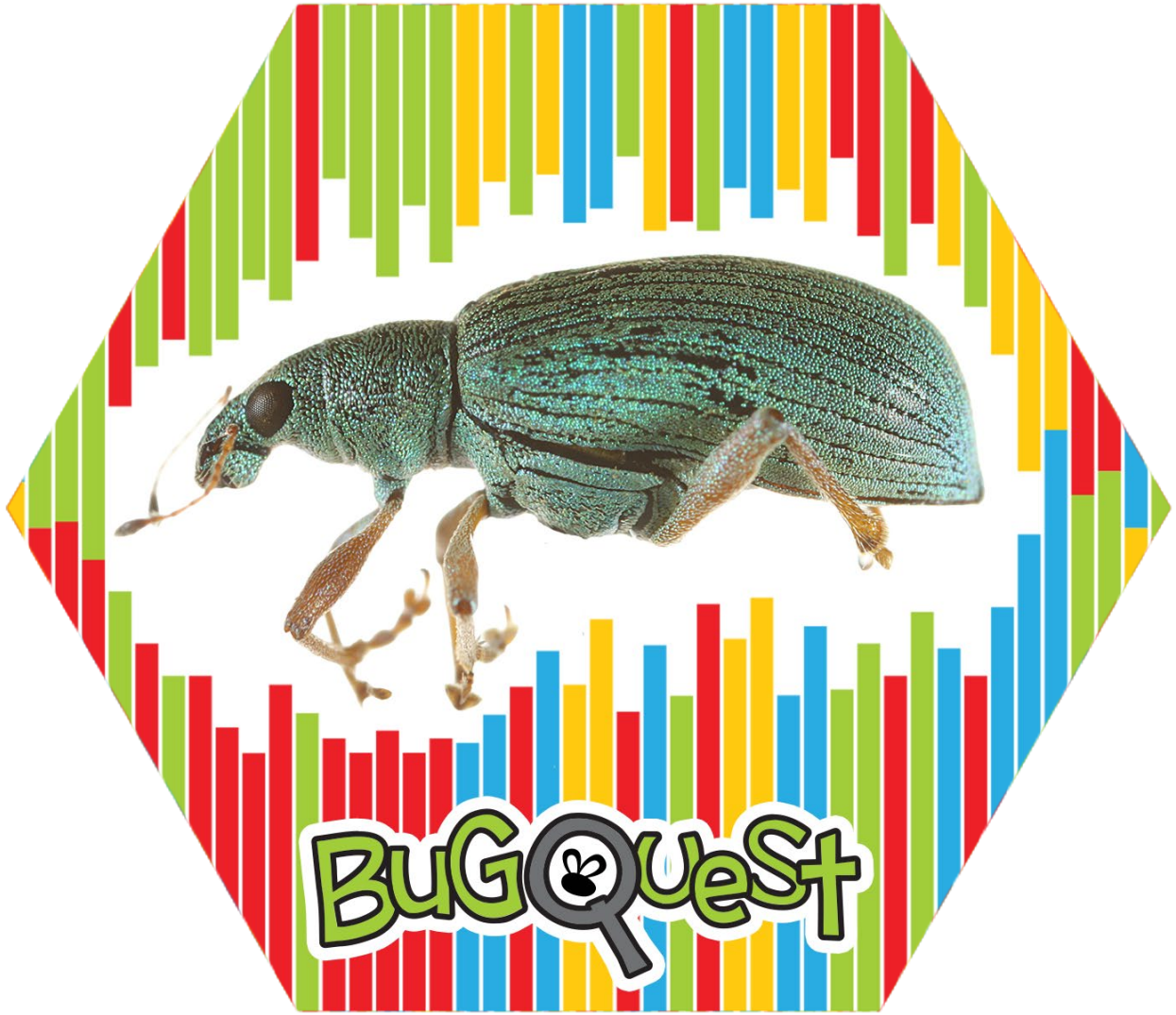
Poecilanthrax sackenii



Large bee fly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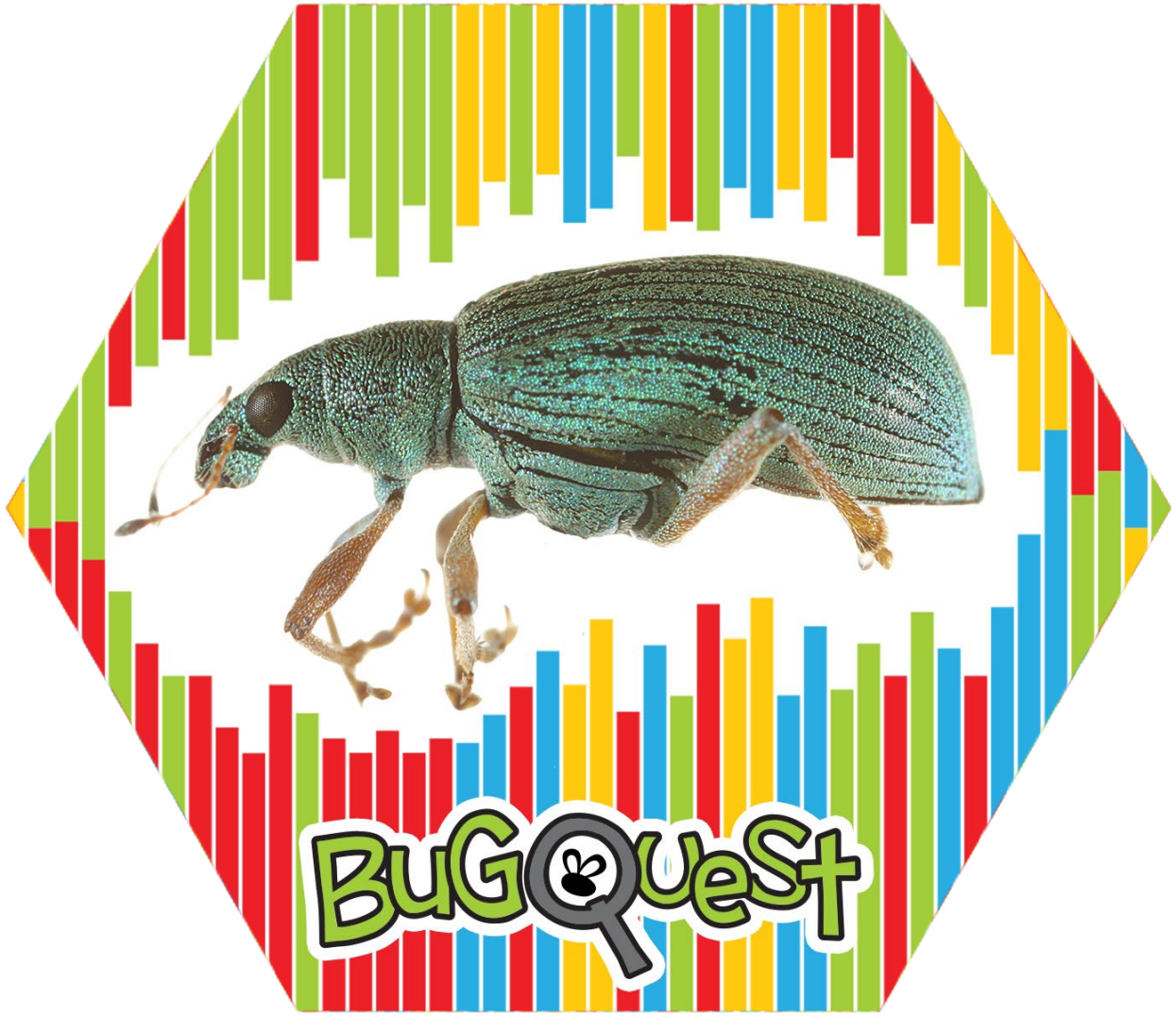
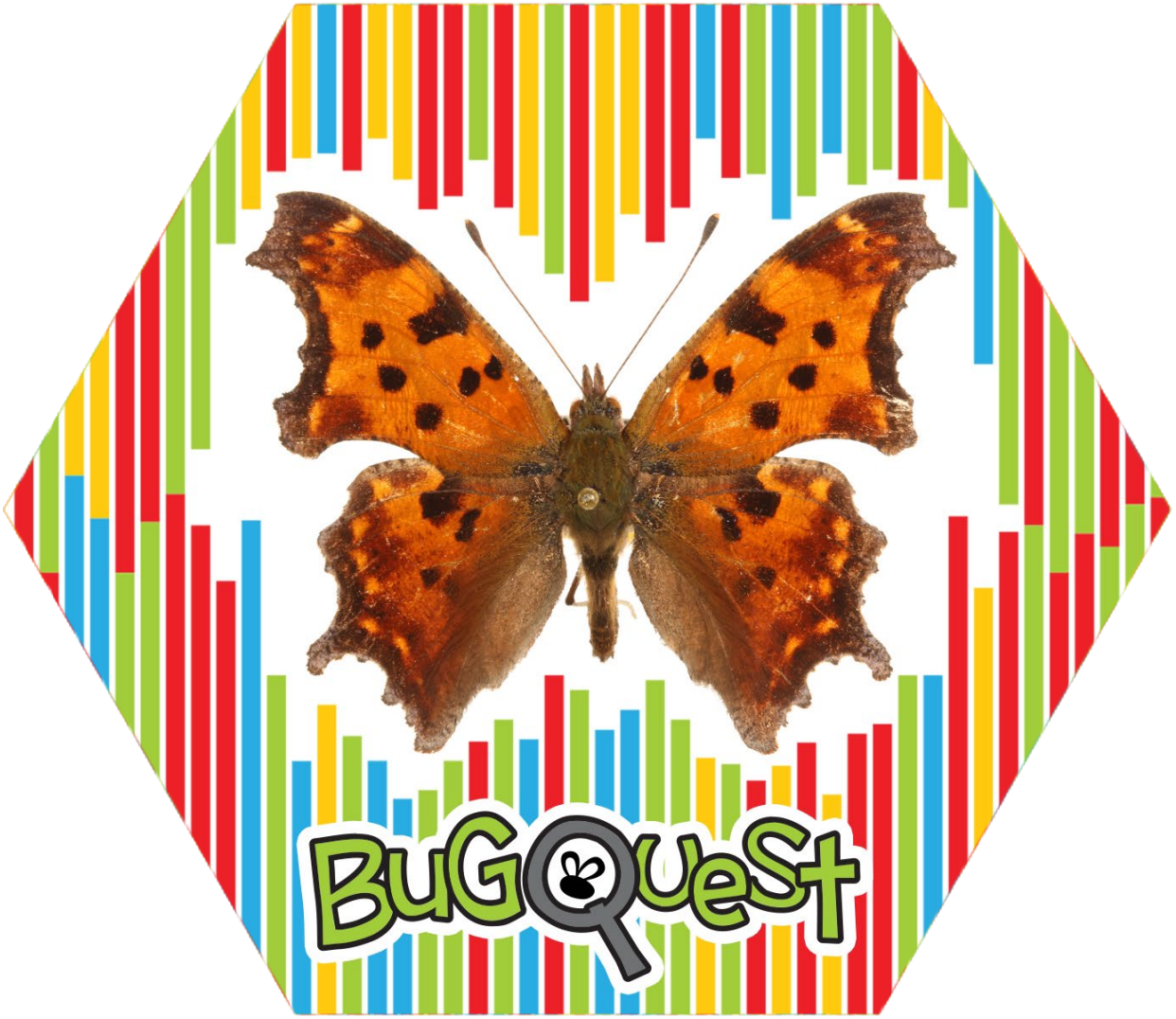
Polydrusus Formosa



Green immigrant leaf weevil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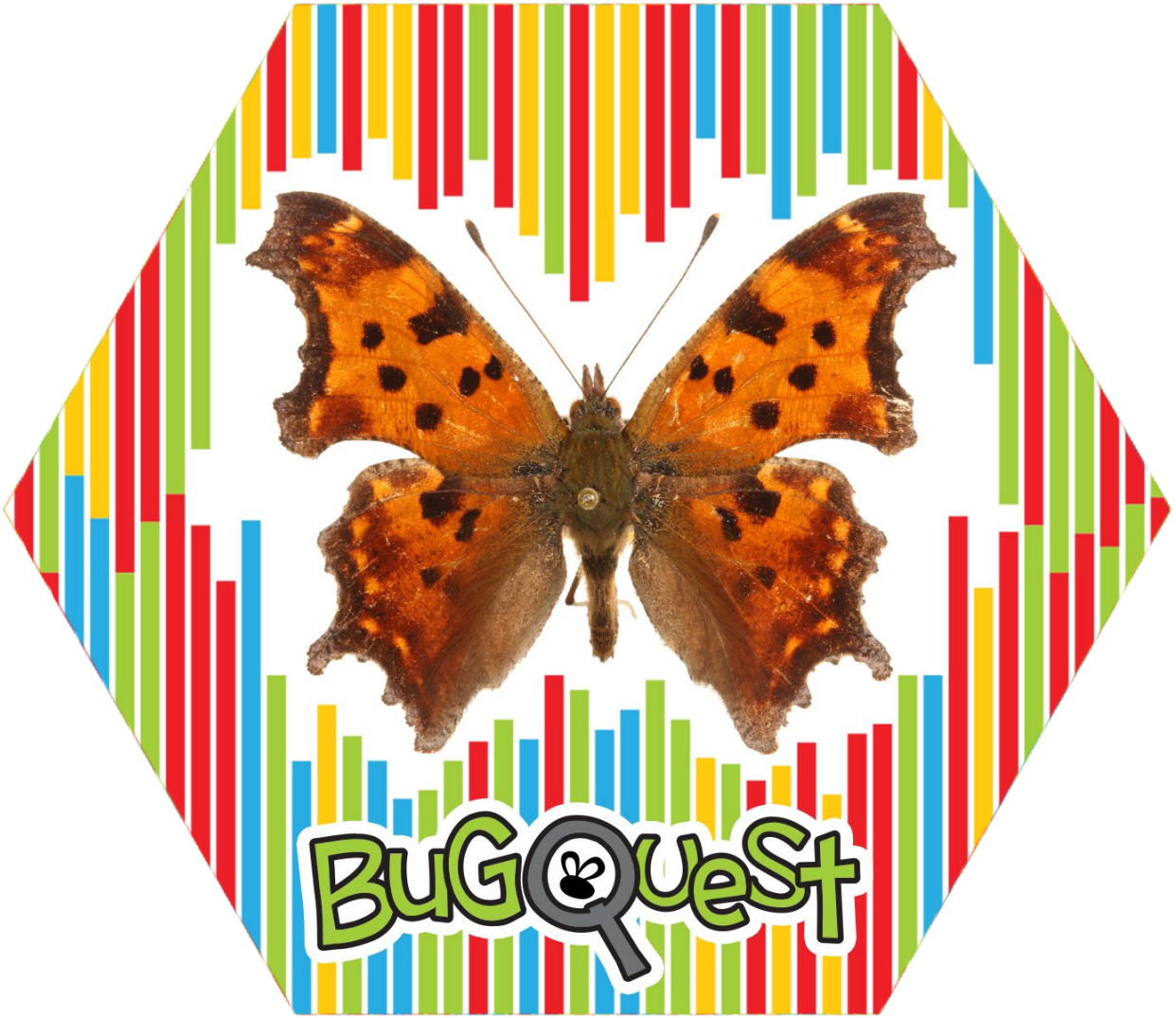
Polygonia comma



Eastern comma

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Stictocephala bisonia

Buffalo treehopper

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Stratiomys barbata

Solider fly