

# **THE BOMBARDIER BEETLE BLASTS EVOLUTION**

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# THE BOMBARDIER BEETLE

## BLASTS EVOLUTION

### INTRODUCTION

The Bombardier Beetle, with its unique fire power, is able to deter and even kill its predators. This unique fire power is its chemical defense mechanism. This paper will describe the Bombardier Beetle and its defense mechanism. It will explore the evolutionary and creation view of the development of this defense mechanism. Then it will show how this amazing mechanism could not have evolved, but must be the result of special creation.

### THE BOMBARDIER BEETLE

The Bombardier Beetle is an interesting and colorful insect. There are over 500 species globally with over 50 species in the United States.<sup>1</sup> One common species has a reddish-orange head, legs, and thorax with two bluish-green hard wing coverings called elytra that protect the wings. Bombardier Beetles range from 7/16 to 7/8 of an inch (1.2 to 1.8 cm.) in length.<sup>2</sup>

Bombardier Beetles are found on every continent except Antarctica.<sup>3</sup> They are typically found in grasslands or woodlands in the northern and southern temperate zones. They are

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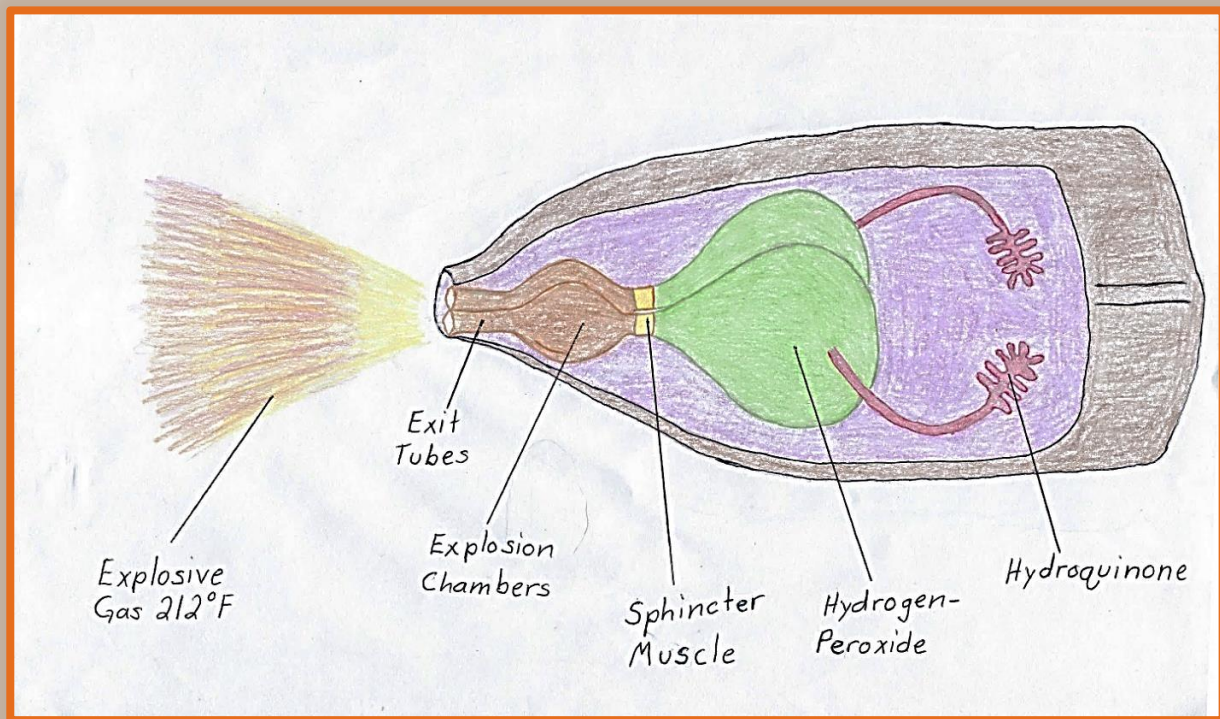
<sup>1</sup> "Bombardier Beetles," <https://www.nationalgeographic.com/animals/invertebrates/b/bombardier-beetle/> (Accessed January 5, 2021).

<sup>2</sup> "Bombardier Beetle," [http://www.creationwiki.org/Bombardier\\_beetle](http://www.creationwiki.org/Bombardier_beetle) (Accessed January 19, 2021).

<sup>3</sup> Ibid.

nocturnal and spend the day hiding under grass or leaves. Bombardier Beetles are carnivorous with a diet consisting primarily of small insects.<sup>4</sup>

Bombardier Beetles lay their eggs in a warm moist, concealed environment where predators such as ants, frogs, and toads are not likely to find them. After the eggs hatch, the beetle larva will eat small insects. The larva undergo several molts before reaching maturity. Bombardier Beetles may live up to two years.<sup>5</sup>



*Illustration by author*

<sup>4</sup> "Bombardier Beetles," <https://www.nwf.org/Educational-Resources/Wildlife-Guide/Invertebrates/Bombardier-Beetles> (Accessed January 5, 2021).

<sup>5</sup> "Bombardier Beetle," [http://www.creationwiki.org/Bombardier\\_beetle](http://www.creationwiki.org/Bombardier_beetle) (Accessed January 19, 2021).

## DEFENSE MECHANISM

An amazing and extremely complex defense mechanism is hidden in the beetle's abdomen.<sup>6</sup> When a Bombardier Beetle is threatened or attacked by a predator such as an ant, frog, or toad it will shoot a spray of acidic chemicals that, when combined, reach a temperature of 212° F (100°C).<sup>7</sup> These chemicals can burn and even kill its attackers.

The Bombardier Beetle's abdomen houses two large glands called Pygidial glands. In these glands are stored two chemicals, hydrogen peroxide and hydroquinone.<sup>8</sup> Each of these glands has a valve controlled by a sphincter muscle to keep the chemicals from leaking into the combustion chamber. To protect itself from these explosive chemicals, the beetle adds an inhibitor into the chemicals. But with the chemicals inhibited, the beetle cannot fire its defense mechanism. therefore when the beetle is going to fire, it must add an anti-inhibitor into the combustion chamber along with a mix of 23% hydrogen peroxide and 10% hydroquinone. Then the chemicals explode, forcing the exhaust out of the combustion chamber and down the exit channels. This mixture sprays out the tip of the abdomen.<sup>9</sup> The abdomen can be aimed to spray in any direction. A very flexible abdomen helps the beetle aim faster and easier.<sup>10</sup>

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<sup>6</sup> "Bombardier Beetle," [http://www.creationwiki.org/Bombardier\\_beetle](http://www.creationwiki.org/Bombardier_beetle) (Accessed January 19, 2021).

<sup>7</sup> Eric M. Arndt, Wendy Moore, Wah-Keat Lee, & Christine Ortiz, "Mechanistic origins of Bombardier Beetle (Brachinini) explosion-induced defensive spray pulsation," *Science* 348(6234) (May 1, 2015):563-567.

<sup>8</sup> Ibid.

<sup>9</sup> David F. Coppedge, "Creation vs Evolution: The Bombardier Beetle Challenge," <https://crev.info/2018/02/creation-vs-evolution-bombardier-beetle-challenge/> (Accessed April 28, 2021).

<sup>10</sup> "Bombardier Beetle," [http://www.creationwiki.org/Bombardier\\_beetle](http://www.creationwiki.org/Bombardier_beetle) (Accessed January 19, 2021).

To keep from cooking itself the beetle sprays in a series of short, rapid bursts, up to 500 per second.<sup>11</sup> The short bursts also keep the beetle from flying forward from the recoil and helps it to have better directional control.

## EVOLUTION

According to the evolutionary view, the process by which the Bombardier Beetle's defense mechanism evolved occurred in the following steps.

Quinones appeared and sat on the epidermis (outer layer cells) of the beetle making it unpleasant to predators.

Small infoldings started to appear in the epidermis to store and secrete the quinones. A few of the small infoldings became deeper until they began to look like separate reservoirs.

The cells that make and discharge toxic chemicals developed into multiple layers and became ducts to carry chemicals to secretory cells from the chemical reservoirs. Muscles moved around and positioned themselves to better control the conveyance and discharge of the chemicals.

Cells that make and discharge catalases to be used in the reaction of the hydroquinones and hydrogen peroxide began to appear along the tubes that lead from the chemical reservoirs so that the chemical reaction could occur with even greater power. Over time, the chemicals and their reactions became stronger and more concentrated for greater effect.

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<sup>11</sup> "Bombardier Beetles," <https://www.nationalgeographic.com/animals/invertebrates/b/bombardier-beetle/> (Accessed January 5, 2021).

The cellular walls of the tubes began to thicken to expel the chemicals at higher pressures as the chemical concentrations became stronger. Also, the abdomen of the beetle became longer and more flexible so that the beetle could move and aim its abdomen more accurately.<sup>12</sup>

## CREATION

*“And God made the beast of the earth after his kind and cattle after their kind and everything that creepeth upon the earth after his kind and God saw that it was good.” Gen. 1:25* God created the Bombardier Beetle and its defense mechanism fully formed and functioning at the beginning of time and they are the same today as they were then. *“And God saw every thing that he had made, and, behold, it was very good.” Gen. 1:31* If God said that something was good, there is no way that anyone or anything can make it better.

## PROBLEMS WITH THE EVOLUTION HYPOTHESIS

Some challenging questions about the evolutionary developmental steps must be considered. How did the quinones evolve and where did they come from? How did the catalyst evolve? How did the beetle determine rapid pulses of exploding chemicals were necessary? How did the beetle’s legs evolve to be able to be sprayed on and not burned? These are only a few of many questions one could ask. How do evolutionists answer them? They cannot. Evolution cannot make such an irreducibly complex defense mechanism or even just a beetle for that matter because evolution is a blind, unguided process which cannot foresee how many random mutations over time will result in abilities and characteristics that may aid in the species survival.

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<sup>12</sup> “Evolution & Origin,” <https://bombardierbeetlewarfare.weebly.com/evolution--origin.html> (Accessed January 18, 2021).

Evolutionist Mark Isaak, in his article “Bombardier Beetles and the Argument of Design” said “The evolution of the Bombardier Beetle is still not completely understood.”<sup>13</sup> They do not completely understand it because it did not happen.

What can the fossil record reveal about the Bombardier Beetle? The oldest known fossil of a beetle with a chemical defense mechanism is of a Soldier beetle (related to the Bombardier Beetle). Evolutionist’s assign an age of 100 million years to this fossil. It was found encased in amber apparently in the act of spraying an attacker.<sup>14</sup> Remarkably, there is no transitional fossil evidence for the evolutionary steps described above. The oldest chemical defense mechanism known in the fossil record appears as a completely intact and fully functioning system. Oregon State University published a paper about this fossil and said “this finding pushes back the known existence of this type of beetle by about 60 million years.”<sup>15</sup> Why is there no evidence in the fossil record of the process evolving as described above?

As stated before, evolution has no foresight. It cannot see into the future and know what to do next. Mutations happen randomly and natural selection cannot know which mutations, though not immediately beneficial, may be needed in the future or may combine to form some new organ or useful function with a survival advantage. Most proposed mutations do not have a survival benefit until the creature is all done evolving. And in nature, nearly all mutations are neutral at best and dangerous at worst.

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<sup>13</sup> “The Bombardier Beetle,” <https://gabriellesinsectbiology.weebly.com/evolution.html> (Accessed April 1, 2021).

<sup>14</sup> “Amber Specimen Captures Ancient Chemical Battle,” <https://www.sciencedaily.com/releases/2007/08/070829143559.htm> (Accessed October 18, 2020).

<sup>15</sup> Ibid.

## CONCLUSION

The Bombardier Beetle's complex defense mechanism has been described. The evolutionary view of its development has been examined and it shows an absence of credible support and a lack of fossil record evidence. In those beetles that have a chemical defense mechanism, the fossil record shows them fully formed and functioning just as in modern beetles. It is clear the Bombardier Beetle and its unique fire power were created by God. ***“For by him were all things created, that are in heaven, and that are in earth, visible and invisible, whether they be thrones, or dominions, or principalities, or powers: all things were created by him, and for him.” Col 1:16***



## BIBLIOGRAPHY

Holy Bible, Authorized Version.

“Amber Specimen Captures Ancient Chemical Battle,”

<https://www.sciencedaily.com/releases/2007/08/070829143559.htm> (Accessed October 18, 2020).

“Bombardier Beetle,” [http://www.creationwiki.org/Bombardier\\_beetle](http://www.creationwiki.org/Bombardier_beetle) (Accessed January 19, 2021).

“Bombardier Beetles,”

<https://www.nationalgeographic.com/animals/invertebrates/b/bombardier-beetle/>  
(Accessed January 5, 2021).

“Bombardier Beetles,” <https://www.nwf.org/Educational-Resources/Wildlife-Guide/Invertebrates/Bombardier-Beetles> (Accessed January 5, 2021).

“Evolution & Origin,” <https://bombardierbeetlewarfare.weebly.com/evolution--origin.html>  
(Accessed January 18, 2021).

“The Bombardier Beetle,” <https://gabriellesinsectbiology.weebly.com/evolution.html> (Accessed April 1, 2021).

Arndt, Eric M., Wendy Moore, Wah-Keat Lee, & Christine Ortiz, “Mechanistic origins of Bombardier Beetle (Brachinini) explosion-induced defensive spray pulsation,” *Science* 348(6234) (May 1, 2015):563-567.

Coppedge, David F., “Creation vs Evolution: The Bombardier Beetle Challenge,”

<https://crev.info/2018/02/creation-vs-evolution-bombardier-beetle-challenge/> (Accessed

April 28, 2021).