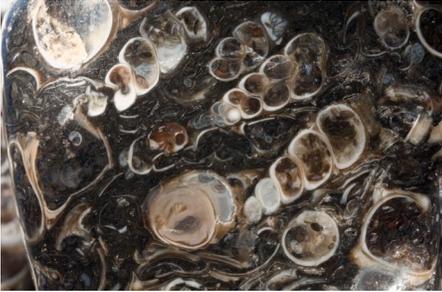


# Turritella Agate

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## What is an agate?

An agate is a crystallized rock, which forms from Chalcedony, a kind of silica, or quartz minerals. Agates are characterized by their grain textures and commonly have bright colors. Many agates can be found in volcanic rocks but are also common in metamorphic rocks. An agate is formed when water, rich in quartz molecules and other minerals, fills into small hollow spaces in rocks. The quartz molecules later form microcrystals that attach to the sides of the hollow spaces. This process repeats multiple times until the rock is completely filled in. Because the process is repeated, banding patterns are often visible. Depending on the variety of minerals,

temperature changes and the “filling in” process, each agate will look different and have different colors and banding patterns.

## Turritella or Elimia tenera?

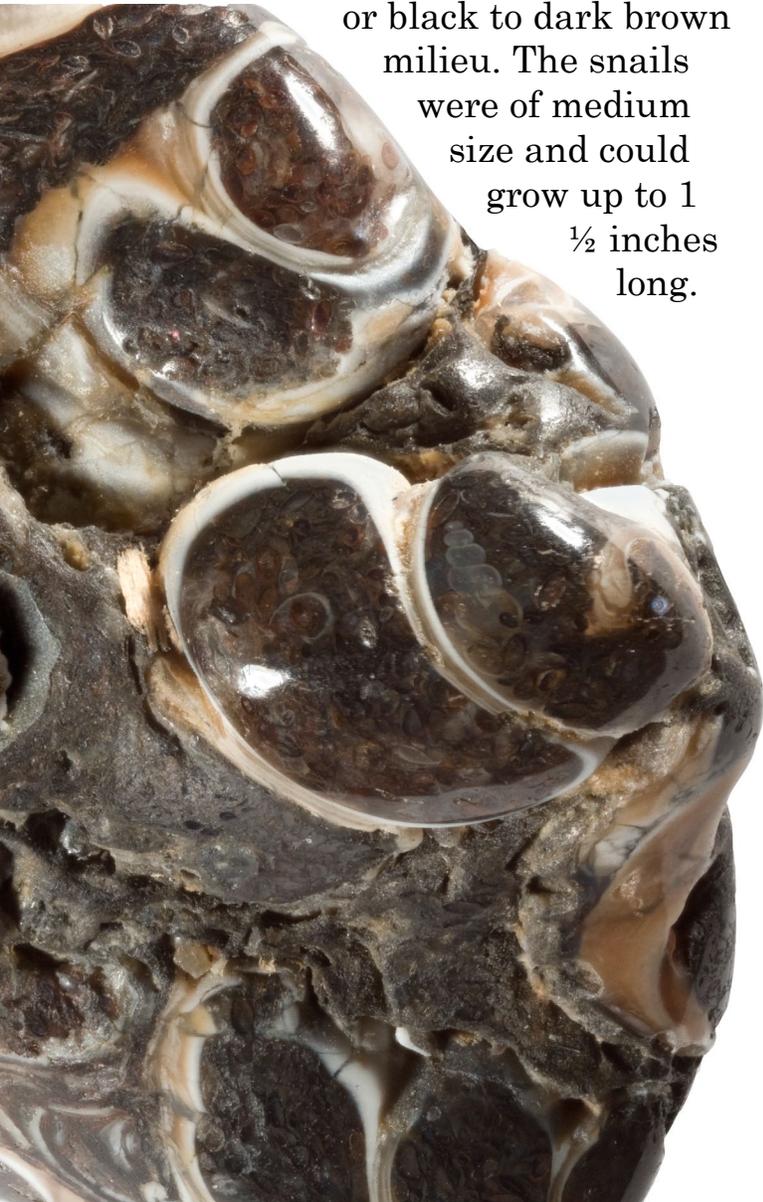
The “Turritella” agate is not actually fossilized snails of the genus *Turritella*, but is of the *Elimia tenera* species, formerly known as *Goniobasis tenera*. *E. tenera* was so named “Turritella” agate because of its resemblance to the genus of sea snail *Turritella* which has been commonly found in Texas and California. The *Elimia tenera* however, are freshwater snails common to the now Wyo-



ming area and are shorter and wider than actual *Turritella* snails. These snails are now extinct but lived during the Eocene Epoch, which lasted from approximately 34-55 million years ago. The fossil beds that the *Elimia tenera* were found in are approximately 46-51 million years old.

## Characteristics

*E. tenera* snails are characterized by their long spiral shells which contain many whorls. Their color can vary from amber, gold, blue, or red and orange in a gray or black to dark brown milieu. The snails were of medium size and could grow up to 1 ½ inches long.



The fossils are generally found in the areas of southern Wyoming, northern Colorado and northeastern Utah. *E. tenera* can be found in the sedimentary rock layers of the Green River Formation, a tributary of the Colorado River. The *Elimia tenera* was washed up near the shorelines of a series of small lakes, give the names: Fossil, Uinta and Gosiute Lakes. The best samples come from the Gosiute Lake area. These areas once had a subtropical climate and were prone to volcanic eruptions. Because of this climate, the fossils were able to be agatized.

## Scientific Classification

Kingdom: Animalia  
Phylum: Mollusca  
Class: Gastropoda  
    clade: Caenogastropoda  
    clade: Sorbeoconcha  
Superfamily: Cerithioidea  
Family: Pleuroceridae  
Genus: *Elimia*  
Species: *Elimia tenera*  
Synonyms: *Goniobasis tenera*





## Equipment

The equipment I used for these images were:

Camera: Canon Rebel XSi

File format: Raw

ISO: 100, 400

Fstop: F16

Shutter speeds:  $\frac{1}{4}$  second - 8 seconds

Lenses: Canon MP-E65mm f/2.8 1-5x

Macro Photo, Canon EF28-135mm f/3.5-5.6 IS USM.

I also used a copy stand to mount the camera, fiber optic lights and a variable height stage. The fiber optic lights were placed on either side of the subject with plastic balls on the ends for diffuse lighting.



## Magnification and Stacking

I photographed the *Elimia tenera* agates from 1-5x magnification.

Each image shown in this article has been stacked using Zerene Stacker software. Each image has between 3 and 16 images compiled together to obtain the optimal focus throughout the entire image. I compiled the images using the PMax stacking method rather than the DMax method. I found that PMax gave a better overall sharpness to the images.





All images © Johanna E. Forish

If you have any questions, comments or concerns please feel free to contact me at [jforish89@gmail.com](mailto:jforish89@gmail.com)

Sources:

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[http://www.agatelady.com/agate-basics.html#how\\_do\\_agates\\_form](http://www.agatelady.com/agate-basics.html#how_do_agates_form)

<http://en.wikipedia.org/wiki/Agate>

[http://en.wikipedia.org/wiki/Elimia\\_tenera](http://en.wikipedia.org/wiki/Elimia_tenera)

