

# Trigonotarbida Exploration

A Bite to Drink

## Ancient Arachnids

About 414 million years ago, during the Late Silurian period, the first invertebrates made their way onto the land from the sea. Among them were the trigonotarbids, a group of early arachnids closely related to modern spiders that terrorized the Earth's earliest terrestrial ecosystems [B].

## Key Features

- (1) Upwards-Facing Eyes** - The trigonotarbids' eyes face directly up, making them pretty useless for finding prey on their same level, instead using them mostly to spot potential predators [B].
- (2) Flat Body Plan** - The trigonotarbids' wide, flat bodies indicate that they likely lived in crevasses underneath rocks and deadfall. These serve as ideal hiding places to ambush prey from, as well as provide a safe place to moult, or, in later species, hide from predators [B].
- (3) No Spinners** - Unlike modern spiders, which have special organs called spinnerets to produce silk on their rears, trigonotarbids did not have these, and thus could not spin webs [B]. Instead, they hid underneath rocks and leaves to ambush their prey.
- (4) Hairy Feet** - The trigonotarbids' feet featured many small, fine hairs on their tips, which were likely used to detect vibrations from prey moving nearby, much like modern spiders [B].
- (5) Fangs** - Similar to modern spiders, trigonotarbids had large, inward-facing fangs to kill their prey with. However, unlike modern spiders, trigonotarbids could not produce venom, instead relying on the sheer size of their fangs and body to immobilize their prey so they could eat it [B]. Because of this, trigonotarbids could only eat things smaller than themselves, and thus could only hunt very small prey like early insects.
- (6) Spines** - While the earliest trigonotarbids were the top predators in their day, by the end of their time, they were no longer the top dogs. Early reptiles, which were much, much larger than them, became the new top predators, and the trigonotarbids had to adapt to avoid being eaten. As such, later trigonotarbids featured spines and more complex exoskeletons to help ward off potential predators [B].

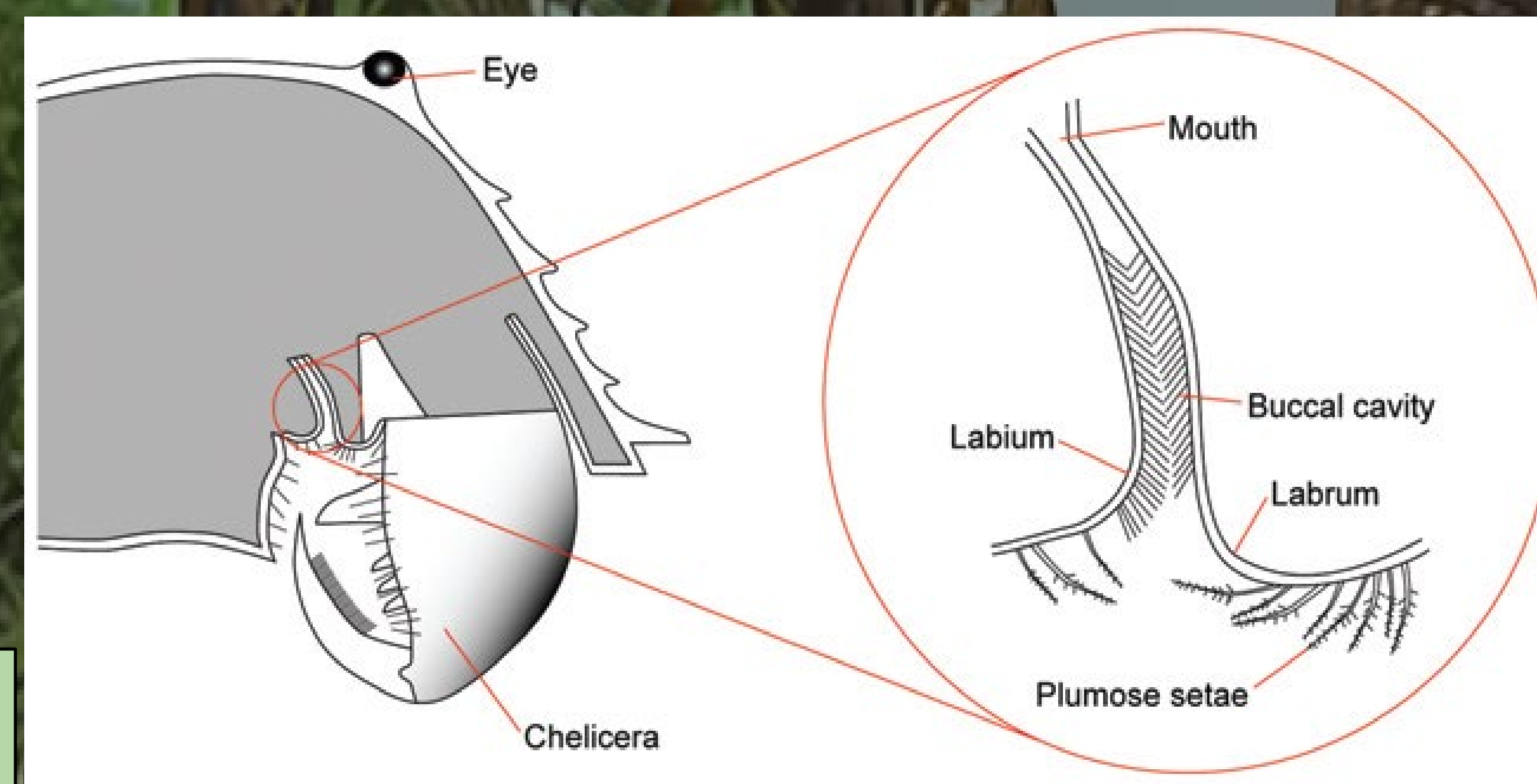


Diagram showing a trigonotarbid's mouth [B].

Much like modern spiders, trigonotarbids had to digest their food externally by pouring their digestive enzymes on their prey and drinking up their liquefied insides. This unusual feeding method comes with a major downside - they can't handle any solids entering their body. As a result, they developed a series of hairs lining their mouths to filter out any solid bits of their meal so they don't choke [B].

## Geographic/Geological Range

Much of the evidence for Trigonotarbids is found in coal measure deposits in a few parts of Europe and North America. However, there is a location in Argentina where there has been some evidence for Trigonotarbids. With their locations, most of them have been dated back to around the Carboniferous period with some being as early as the late Silurian period and some as late as the early Permian period. Trigonotarbids had an evolutionary burst in the Middle Devonian due to the expansion and diversification of plants because new niches needed to be filled. They also had a second burst in the late Carboniferous and peaked in diversity during the Westphalian age of the Late Carboniferous [E].

## Miniature Monsters



The body size of Trigonotarbids ranges from 4mm to 20mm. Despite the fact that these were major predators, their size was actually very small [A].

A trigonotarbid carbon fossil, with centimeter bar for scale [F]

## Body Armor

During the Late Carboniferous, Trigonotarbids were no longer top predators. They had to develop armour to protect themselves in the form of spines and dense dorsal tuberculation [E]. Tubercles are small rounded projections that made it hard for predators to handle Trigonotarbids [B].

## Bibliography

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