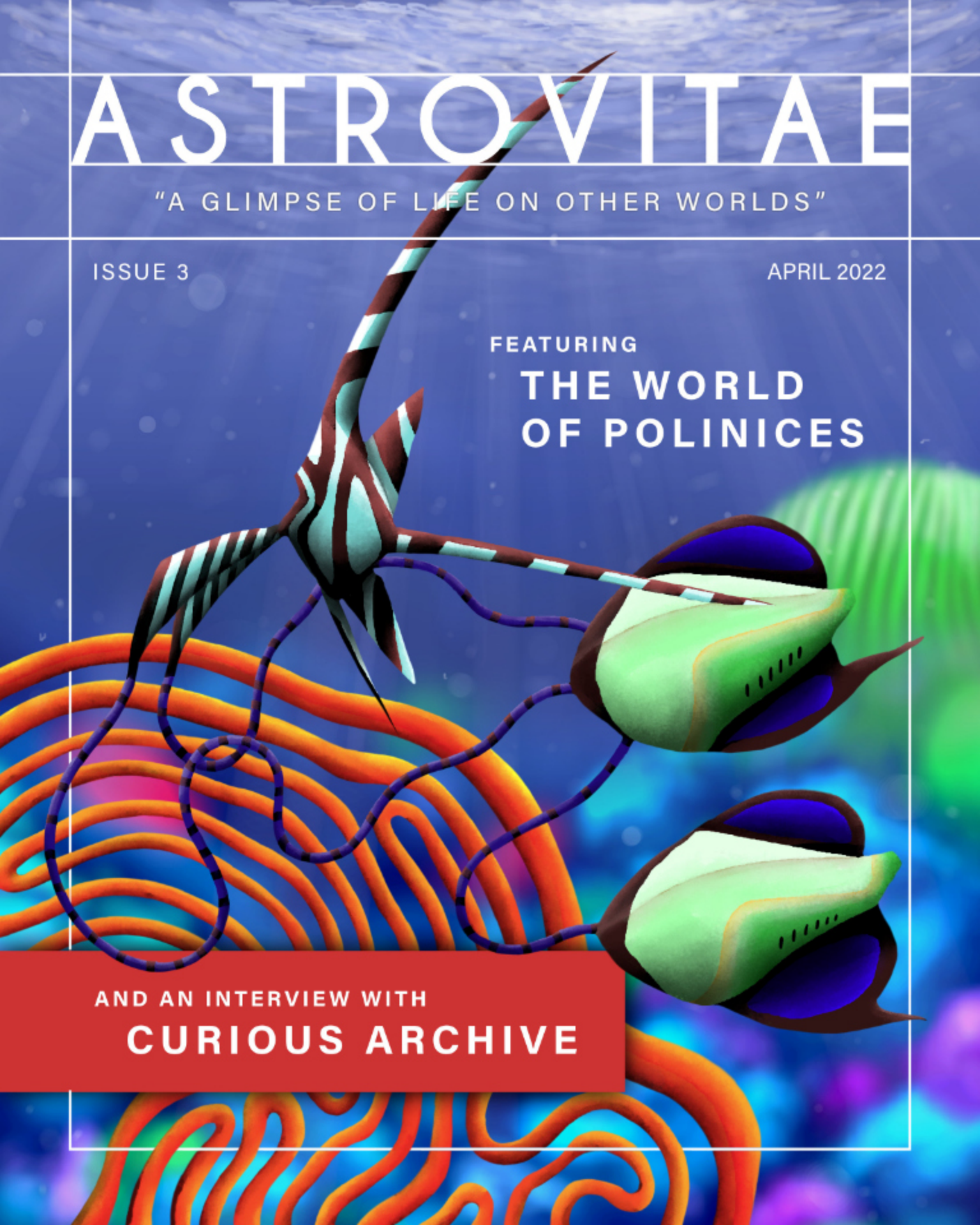
ASTROVITAE

"A GLIMPSE OF LIFE ON OTHER WORLDS"

ISSUE 3

APRIL 2022



FEATURING

THE WORLD OF POLINICES

AND AN INTERVIEW WITH

CURIOUS ARCHIVE

ISSUE CONTENTS:

SECTION CATEGORIES:

Each article within the body of the magazine is tagged with an icon that best summarizes the type of content it contains. Listed below are all of the existing icons for readers to familiarize themselves with:

SOFT SPEC
Light research with an emphasis on conceptualization

ALIEN SPEC
Xenobiological anatomy, biology, and evolution

HARD SPEC
Heavy research or use of data in worldbuilding

PLANET SPEC
Focus on planets and their unique features or physics

EARTH SPEC
Involves Earth or organisms from present day

UNIVERSE SPEC
Unnatural or otherworldly physics and matter

PALEO SPEC
Involves organisms from Earth's past history

MYTH SPEC
Related to cryptids, fantasy, and mythology

MICRO SPEC
Focus on small organisms like mites, viruses, and cells

ENVIRO SPEC
Emphasis on environment, landscapes, or scenery

LETTER FROM THE EDITOR:

Dear Reader,

Thank you for your interest in Astrovitae Magazine! The publication has slowly grown since its first debut in 2021 and there are many plans coming for the future. As you may have noticed, the front cover has been illustrated by the artist J. J. aniorte. He is one of my favorite speculative biology artists (which is hard to admit, as I have so many favorites) and I am happy to promote his project *Polinices* in this third issue. Michal Sadowski, also known as Ycyprid online, created three amazing spreads representing each section of the magazine. Both artists did an awesome job, and I hope that this is the start of a new tradition where members of the community can create special illustrations for new issue releases.

In January of 2022, I applied to a local museum for a job. To my surprise, the organization produces a quarterly journal called *Inland Seas*. The employers saw my Astrovitae work and knew that my editorial skills would prove useful—and I was eventually accepted for the position! So in a roundabout way, my work for Astrovitae has given me an opportunity to generate wealth from my creative skills. I mention this not to brag, but to show that it is quite possible to profit from your work in some way as an artist. When I first created Astrovitae, I intended to promote smaller artists in the community and help advocate for their work online. I hope that contributors participating in Astrovitae can use the magazine to jumpstart their own artistic careers, or find a creative path for themselves that will take them on a fulfilling artistic journey—even if that final destination is unexpected (I never thought I'd work on another magazine, but here I am)!

Thank you for reading this issue's letter. Like always, I hope you enjoy the art and projects curated for the largest issue of Astrovitae thus far, and I promise that there is much more great content to come in the future!

Sincerely,

Domenic Pennetta
Founder of Astrovitae & Chief Editor

Donate: *Producing a new issue of Astrovitae Magazine takes a lot of work! As an editor my duties include reaching out to artists, corresponding with contributors, editing text submissions and images, and promoting the magazine online and over social media. Although Astrovitae is very much a labor of love, a small donation or two would really support the editor, the magazine, and its featured artists. If you would like to donate, please visit www.ko-fi.com/astrovitae.*

YOUTUBE VIDEO

THE ISLA PROJECT NOW ON YOUTUBE!

October 30, 2021

The *Isla Project* by Oliver Gries-Hoffman moved onto Youtube in October of 2021. Released just this year, in January of 2022, episode 2 of the project focuses on parasitism to explain important biological concepts and highlight interesting alien parasites, their weird behaviors, and other xenobiology. Check out the episode online and stay tuned for a third episode releasing soon!

Watch episode 2: *https://www.youtube.com/watch?v=Pad63awt_dI&ab_channel=TheIslaProject*

KICKSTARTER

THE REBIRTH OF CM KOSEMEN'S SNAIAD

March 17, 2021

Snaiad makes its long awaited return with new illustrations of old creatures. The artist CM Kosemen began reworking his project long ago, but recently he has been showing more illustrations and details behind the history and creatures that inhabit an alien planet. You can see his progress on his Patreon page, which you are encouraged to support!

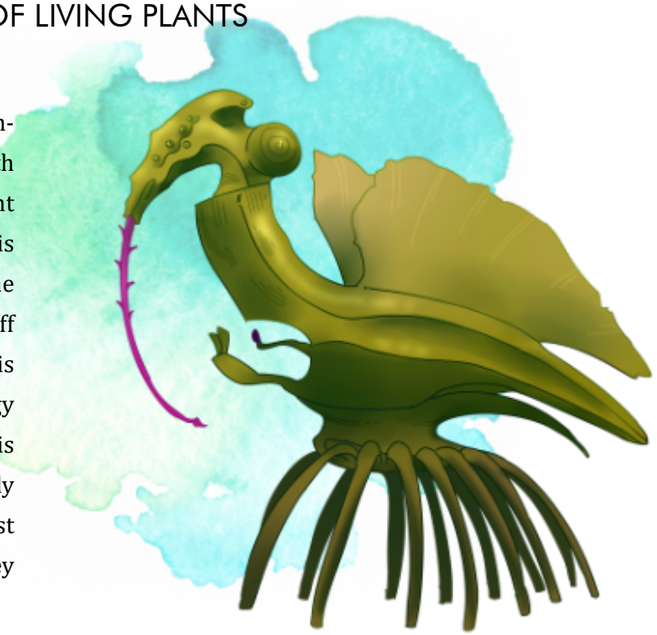
Support Snaiad on Patreon: *https://www.patreon.com/cmkosemen*

ART PROJECT

GESSNER II | A WORLD OF LIVING PLANTS

January 25, 2021

Gessner II, also known as "Greenhouse", is a world brimming with sentient and non-sentient plant organisms called 'animaphytes'. It is unclear if the popular artist Wayne Barlowe is creating a few one-off xenobiological paintings, or if this is the origin of a full blown xenobiology project in the same vein as his previous project, *Expedition*. Only time can tell, but for now, let's just enjoy his new paintings as they release on Instagram!



Rendition of Barlowe's 'thorntongue' creature by artist Savely Kochnov

YOUTUBE VIDEO

THE END OF PROJECT MIIRA?

February 14, 2022

The YouTube spec project *Miira* by the creator Brotherhood of Cadendale has ended after only 3 episodes. The creator released an update expressing his disinterest in continuing the project and maintaining his discord server. If you haven't seen the project, Miira is a spec project illustrated in a pixel art style with enticing and lively music. This was the creator's first ever speculative project, so it is no surprise that it became short lived. But who knows? Maybe Brotherhood of Cadendale may one day return to the project, or create a better one.

See the first episode of Project Miira: *https://youtu.be/WW-mY1481lE*

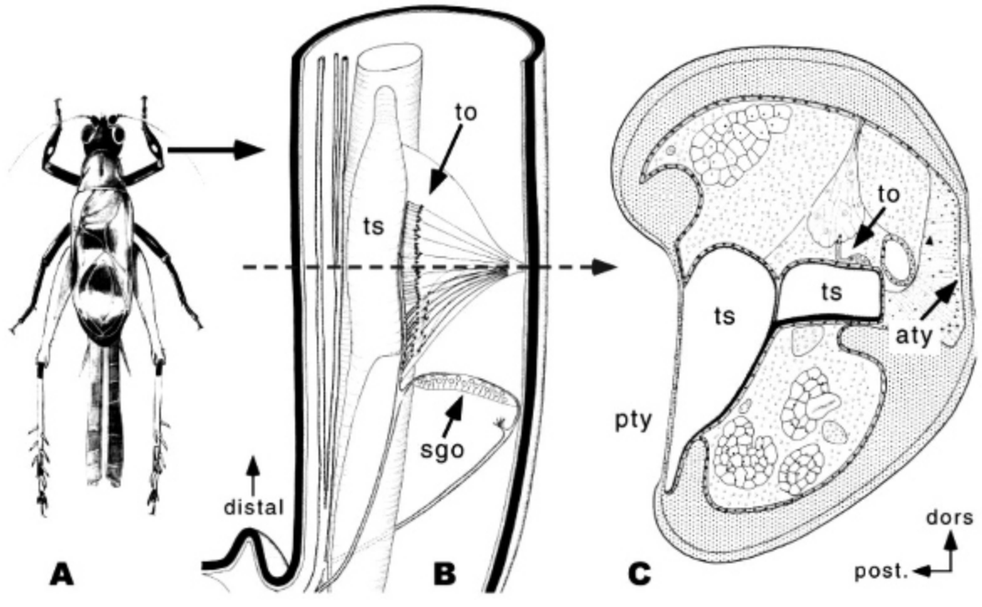


Illustration of a cricket's oval tympana / tibia from the journal Structure, Development, and Evolution of Insect Auditory Systems

BLOG POST

A BRIEF STUDY ON THE SENSE OF HEARING

January 29, 2022

Sigmund Nastrazzurro, creator of the project *Planet Furaha* and author of the blog *Furahan Biology and Allied Matters*, posted his second part of a study on the mechanisms of hearing. Sigmund explores the inner workings of the sense of hearing among organisms and how they might have evolved and adapted the sense over time. His first post compares hearing senses between vertebrates, insects, and arachnids, and sheds light on sensory processes often ignored in many speculative biology projects.

Read part 2 of the post here: *http://planetfuraha.blogspot.com/2022/03/*

KICKSTARTER

LIFE BEYOND US | AN ANTHOLOGY OF ASTROBIOLOGY STORIES

March 19, 2021

What would life be like if it evolved under a cold ocean beneath an impenetrable shell of solid ice? Or on a world with haze obscuring any view of the universe far beyond? Life Beyond Us is an anthology of astrobiology-themed stories written by 22 original award-winning authors and 22 essays by scientists. The book is almost complete, aiming to release sometime in September of this year. Keep your eyes peeled for this brilliant, inspiring, and thought-provoking book!

Follow the Kickstarter: *https://www.kickstarter.com/projects/laksamedia/european-astrobiology-institute-presents-life-beyond-us*

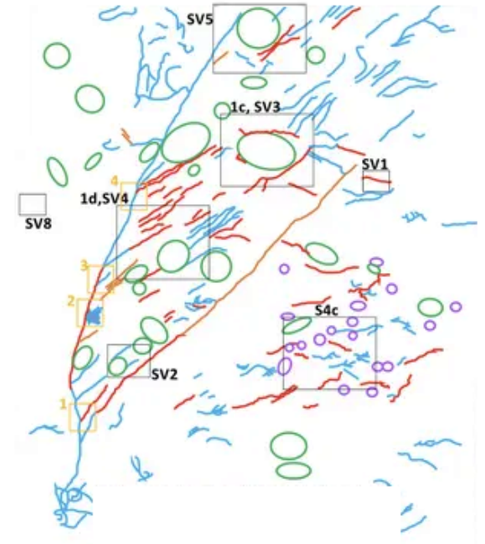
ONLINE ARTICLE

COULD LIFE ON EARTH BE OLDER THAN WE THOUGHT?

April 18, 2021

Scientists from the University College London may have found the oldest known fossils on Earth that are said to date back 4.2 billion years! If this is proven, our current understanding of life on our planet will be challenged; essentially pushing back on the perceived clock for the origin of life.

Read the article here: *https://www.natureworldnews.com/articles/50419/20220418/scientists-claim-microfossils-indicate-earth-s-oldest-life.htm*



Interpretive drawing showing straight, coiled, rosettes, and irregular ellipsoids branching filaments from ScienceAdvances

CURIOUS ARCHIVE

"Stay up to Date on all Things Curious"

AN INTERVIEW WITH THE YOUTUBE CREATOR

RECENT VIDEOS 2022

March 18 - Project Polinices.

March 11 - Spore.

March 4 - Project Amphiterra.

1.) What inspired you to create a YouTube Channel?

I've always been fascinated by the natural world. At the same time, I've always been drawn to speculative fiction and the possibilities of worlds unlike our own. My inspiration to create Curious Archive came out of a desire to explore both the scientific and the fictional—although I wasn't sure where to begin. When I first started uploading I only made videos about hard science and history, but I found myself pulled towards more imaginative topics. Once I made my first video on speculative biology, everything fell into place. Like my channel, the genre is interdisciplinary—merging fiction with science in exciting ways. I'd long been a fan of speculative biology, and I knew a lot of the projects I wanted to feature right away! Since then, I've archived many worlds and alternate timelines but always through a scientific lens, like I'm making documentaries about fictional worlds.

2.) How were you introduced into the genre of Speculative Biology and Evolution?

My introduction to the genre came during my childhood, when I happened upon an airing of The Future is Wild on television. Right away, I found myself hypnotized. That series truly felt like a window into another world, and the idea of science fiction with a strong basis in biology lit up my imagination! I sought out other projects like The Future is Wild in the following years, and eventually discovered the larger category of speculative biology and evolution. I now write about this genre professionally, but with every new project I cover, I feel like a little kid again, pointing at the screen and going "look at that thing!"

3.) Do you have a favorite organism from J. J. Aniorte's speculative project Polinices?

So many of the organisms from J. J. Aniorte's Polinices stand out, but I think my favorite group is the Onirocolia. The patterns of the Onirocolia's digestive zooids are just so surreal and hypnotic. I think they were the first group I saw from Polinices, and I was hooked immediately! The concept of an organism so sinuous and intricate… It looks like a living maze and it's unbelievably appealing to me! As I explained in my video on Polinices, making an underwater species look 'alien' can be challenging, because so much of life in Earth's oceans already seems extraterrestrial. Yet all the creatures J. J. Aniorte invents feel distinct from what's beneath our waves, which is quite a feat of imagination!

4.) What was the favorite speculative project you covered so far on your channel?

I don't think I can choose! For me, part of the fun of speculative biology comes from the variety inherent to the genre. Each project is showing you something unique, be it an alien world, an alternate timeline, or a distant future. Even if the fundamental scientific principles remain the same, each project can offer a new perspective on the age-old "what if" questions of evolution. That variability is what makes exploring these projects so fun… and makes it impossible to choose just one favorite!

5.) Do you have plans to start a speculative biology project of your own?

Stay tuned!

CAPTIVATING WORLDS

By Michal Sadowski (Ycyprid)

PLANET POLINICES

The World of Marine Wonders

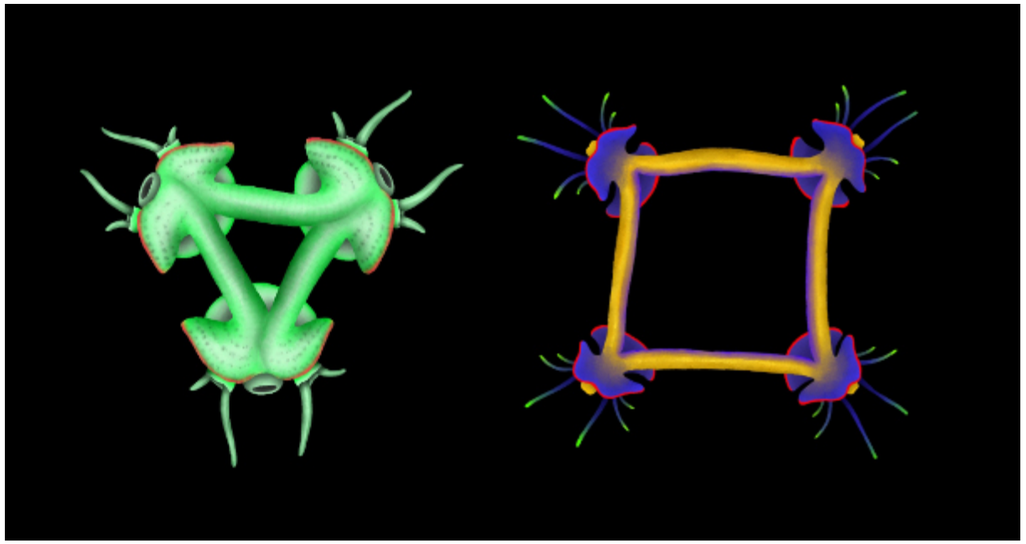
BY J. J. Aniorte — INSTAGRAM: @nature_from_polinices
TWITTER: @jjaniorte

Polinices is an ongoing worldbuilding project that has been six years in the making. Illustrated by the artist, J. J. Aniorte, the project intricately depicts aspects of organisms living on Polinices like their anatomy, behaviors, ecology, and taxonomy. The end goal for the project is the publication of an extensive encyclopedia—one that contains illustrations and descriptions of all the marine life living in the seas of the fictional planet.

The project is strongly inspired by the early periods of the Paleozoic era—whose silent landscapes and biological oddities have been the criteria on which all the work sometimes draws reference from. Polinices is a world endowed with a warm atmosphere and surface, bathed by a blinding sun during the day, and covered by a salty and shallow global ocean. This ocean is interrupted by a single arid and bleak landmass in the center of the planet. In the middle of these waters—growing on the shore of a now sunken continent—Kýanos Metropolis rises as a long barrier reef comparable to that of the American continent. Here the ocean is home to many countless and bizarre sea creatures. J. J. Aniorte and his project invites you to embark on a journey to explore the vibrant reefs of this paradisiacal realm, where neither fish nor corals exist.

The Kingdom Polyzoa. The primary inhabitants of this world. At first glance their forms may appear familiar to us, but upon further study of their anatomy, physiology, and behavior, their true strangeness and complicated evolutionary history is revealed. They are the polizoans, a kingdom of multicellular and tetrablastic organisms divided into seven great phyla which over eons of evolution have given rise to a plethora of creatures that could rival our animal kingdom in diversity.

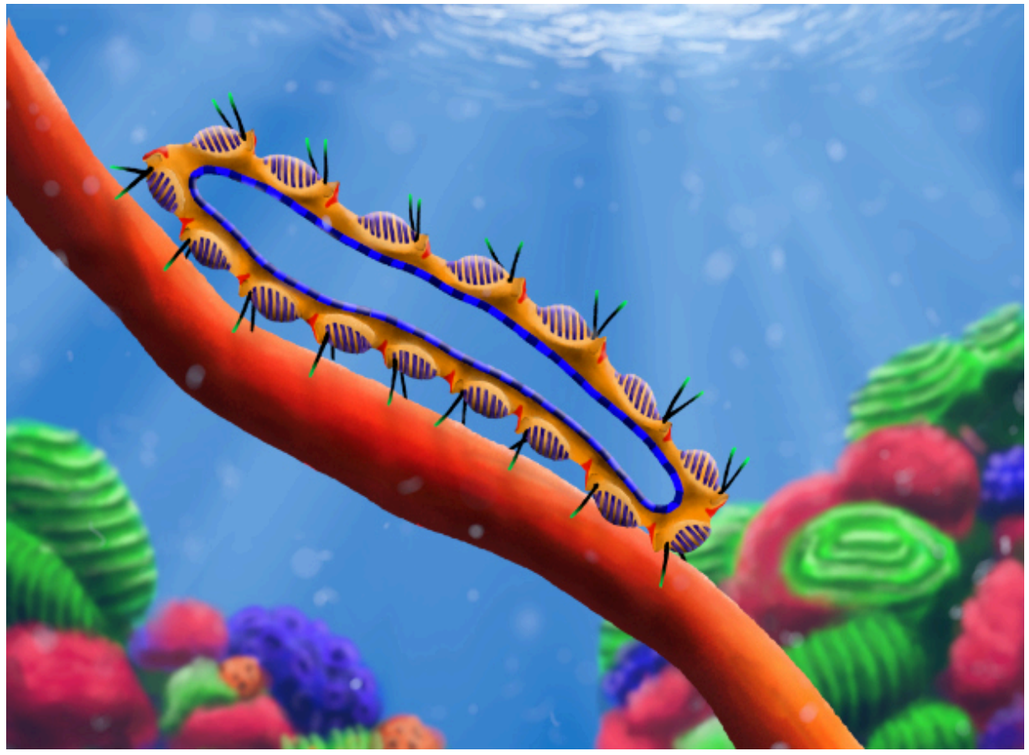
Dipterognatha. *The three body regions of this polizoan swim independently. The head swims from movement of the fins, while the two digestive lobes swim by jet propulsion.*



Labrorhyncha. *Labrorhynchs move by stretching and shrinking the sides of their body. Their geometric shapes vary depending on the number of zooids present in the colonies, as observed in these two genera.*

All polizoans are characterized as colonial organisms that, like many corals, Bryozoans, or siphonophores on Earth, are composed by small clonal individuals called zooids. However the polizoans have taken this concept to another level of complexity, with enormous levels of organization and cohesion between these zooids. The classification of polizoans taxa differs based on the configuration and arrangement of the zooids in the colony. This article will briefly introduce three of its phylums and some of the members that compose them.

The Phylum Annulocoria. The bauplan of annulocorians consist of digestive zooids which are connected to each other through a muscular mantle. This mantle is circular in shape and is located interiorly; forming a common nervous and circulatory system. All zooids have a mouth equipped with a complex dental apparatus and a blind gut. One of the most striking and diverse groups that we find is the Rotigrada class. They are usually small scavengers or detritivores whose circular shape and muscular bands allow the colony to move by turning on the seabed like the track of a military tank. The spicasaccids, on the other hand, are a class of benthic predators. They crawl along the bottom of the seafloor to constrict and impale prey using the hypodermic needle-like

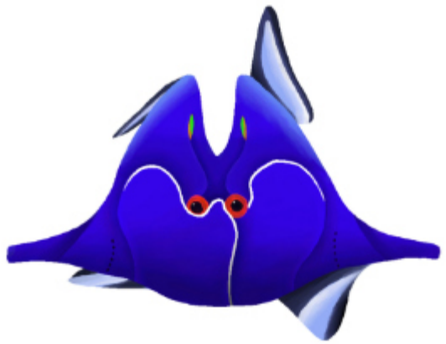


Rotigrada. *These 'sea wheels' move by turning on themselves. In each of the lobes there is a digestive zooid with a mouth and stomach. Part of their teeth have evolved to serve as spines with defensive and gripping functions.*

mouthparts of their zooids. Since the colonies sometimes have hundreds of zooids, if one spicasaccid breaks its oral needle, the colony will kill it off by cutting its blood supply and replacing the zooid with a new individual that will grow via budding. The only annulocorians that have developed true cephalization are the members of class Labrorhyncha, which have centralized their nervous and sensory organs around the mouths of their zooids; located at the vertices of their geometrically shaped bodies.

The Phylum Radioscriptora. This phylum is unique among the polizoans. Their zooids are not linked by tissues and therefore do not share a common nervous system. To communicate with the colony, radioscriptorans have developed the ability to send and receive messages encoded in radio signals. These organisms are composed of two types of zooids: 'drones' responsible

Amphimorpha. *What seems to be a single creature is actually a complicated colony of twelve highly cohesive individual zooids. The symmetry of amphimorphs allows them to swim indifferently forwards and backwards, maneuvering deftly.*

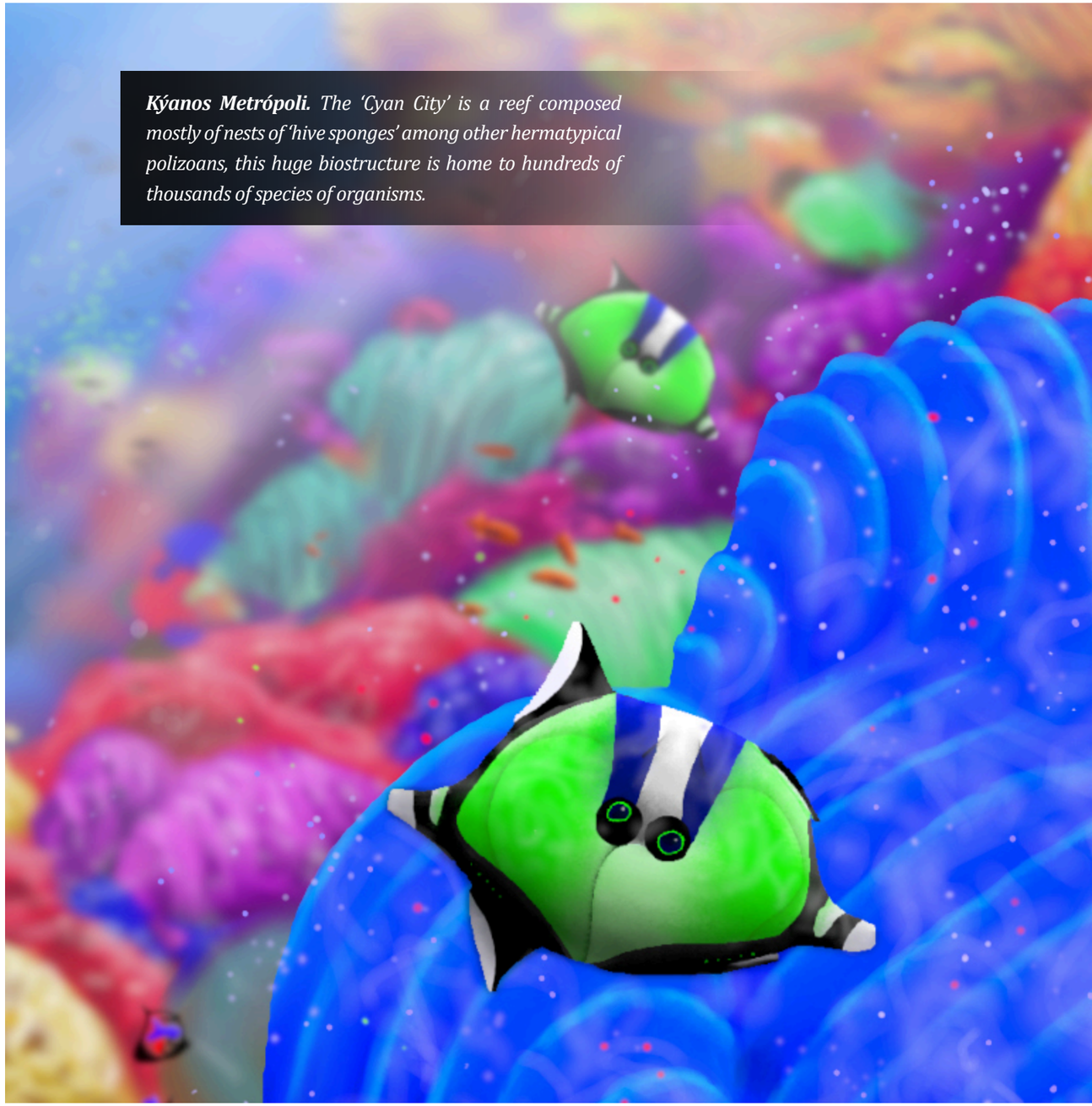


Dolichosiphon caeruleus

Musoma zebra

Amphinatans ruberostomus

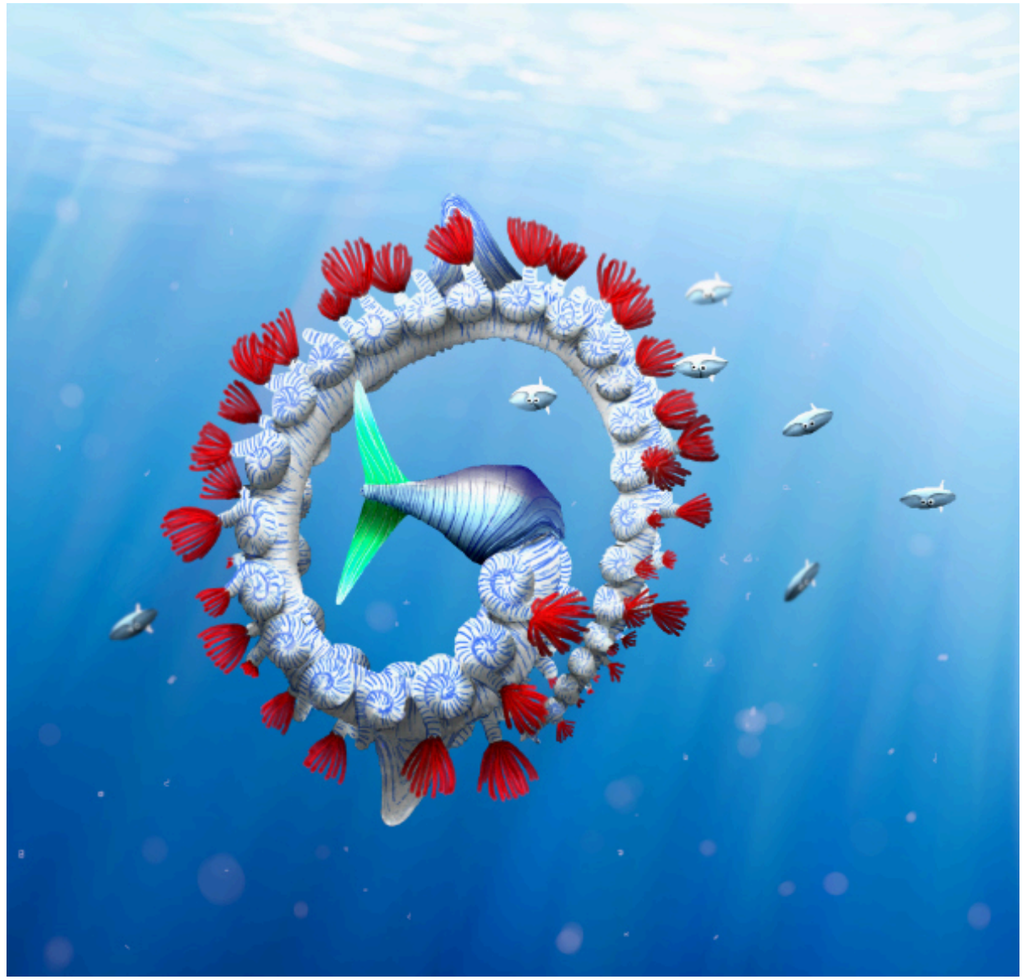
Amphinatans mirabilis



Kýanos Metrópoli. *The 'Cyan City' is a reef composed mostly of nests of 'hive sponges' among other hermatypical polizoans, this huge biostructure is home to hundreds of thousands of species of organisms.*

Order Onirocolia. *These close relatives of the stegocaudates have mostly sedentary and suspensivorous habits, anchored by the caudal zooid to reefs. The tubular shell grows and develops sinuous forms.*

The Phylum Ankylenterea. This taxon is characterized by zooids that share the same digestive tract. The stomachs of each individual lead to a shared intestine that ends in a zooid specialized in using its mouth as an anus. Most of them are swimming colonies protected by hard shells; with the exception of the anal zooid shaped like a fleshy fin (comparable to a fish's tail that produces similar displacing lateral movements). The most primitive forms have tens or even hundreds of digestive zooids responsible for both respiration and the trapping of plankton using their feathery oral tentacles (like the gentle giant Cornupiscis). Other more modern groups have reduced the number of zooids responsible for digestion to just one or have transformed one zooid to serve exclusively as a gill. An example of the latter are the omnipresent stego-caudates with an inverted G-shaped shell and a caudal zooid located in the center.



Cornupiscis. *The digestive zooids of this ankylenterean form spiral shells which they inhabit. The muscular fin zooid allows it to perform fast flights for short periods of time.*

The Mycelial Forest. *Take a closer look at the forest, you can see remains of the animals recently fallen victim to the deadly arbor mushrooms.*

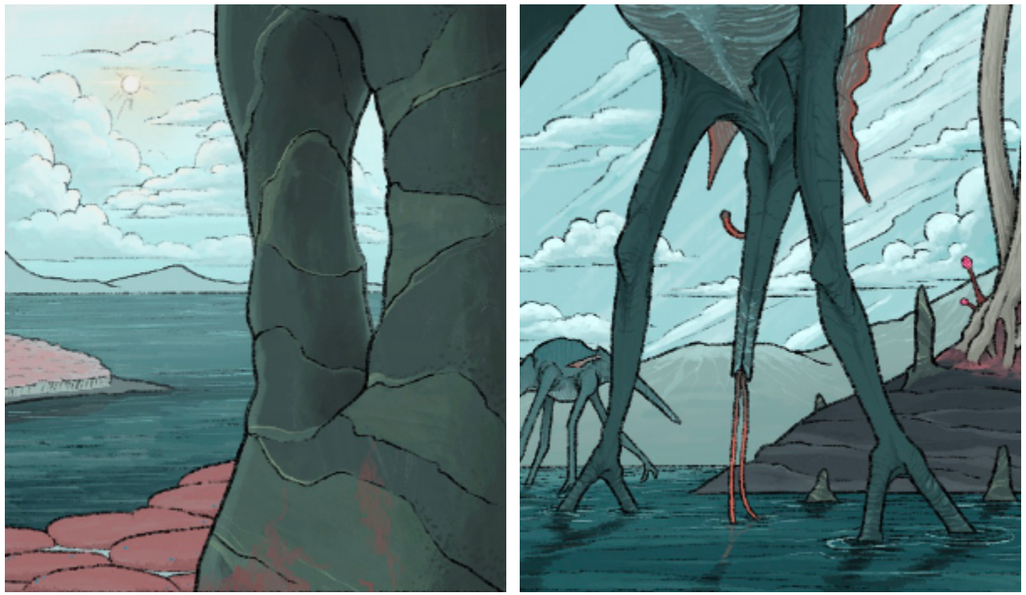
A GLIMPSE OF VITA:

A Look at the Mycelial Forest

BY ALEXANDER J. CARBO — *INSTAGRAM: @ajc.create*
WEBSITE: www.ajccreate.art

Welcome to the world known as Vita where we will focus on a biome called the Mycelial Forest. Vita is one of two moons orbiting a large gas giant. This gas giant, and Vita's sister moon, impose massive silhouettes that can be seen in the skies from Vita's surface. The Mycelial Forest and its inhabitants are an example of the earliest forms of life found on this speculative planet. As time marches forward, there will be many more biomes that form, and a plethora of creatures that grow to inhabit them. Someday in the near future a book will be created that will transport you across these bizarre landscapes on this flourishing moon.

The Mycelial Forest. One of the most bizarre yet stunning biomes on Vita is the aforementioned Mycelial Forest. The forest is home to a couple of wildly different ecosystems that could be split into two encompassing regions: one region reaching mountainous heights in the clouds, and the other dark, dank, and yet surprisingly teeming with incredible life. Found in both layers of the forest, the upper and lower regions, monolithic structures jut out from the ground and reach great heights. They may appear as rocks but are actually a form of calcified flora which carry liquid nutrients from the forest floor all the way to the upper region or canopy of the forest. This is analogous to how coral skeletons are constructed on Earth; as corals are microscopic and photosynthetic engines that convert sunlight into limestone. The monoliths have pores that release mineral-rich liquids for plants and animals to indulge. This abundance of minerals allows for a diversity of flora populating the areas surrounding the monoliths. New monoliths sprout on the shores and on the forest floor due to high levels of calcium in the soil. The monoliths take years to grow to the size of their ancient cousins; which are the true backbones of this incredible biome.

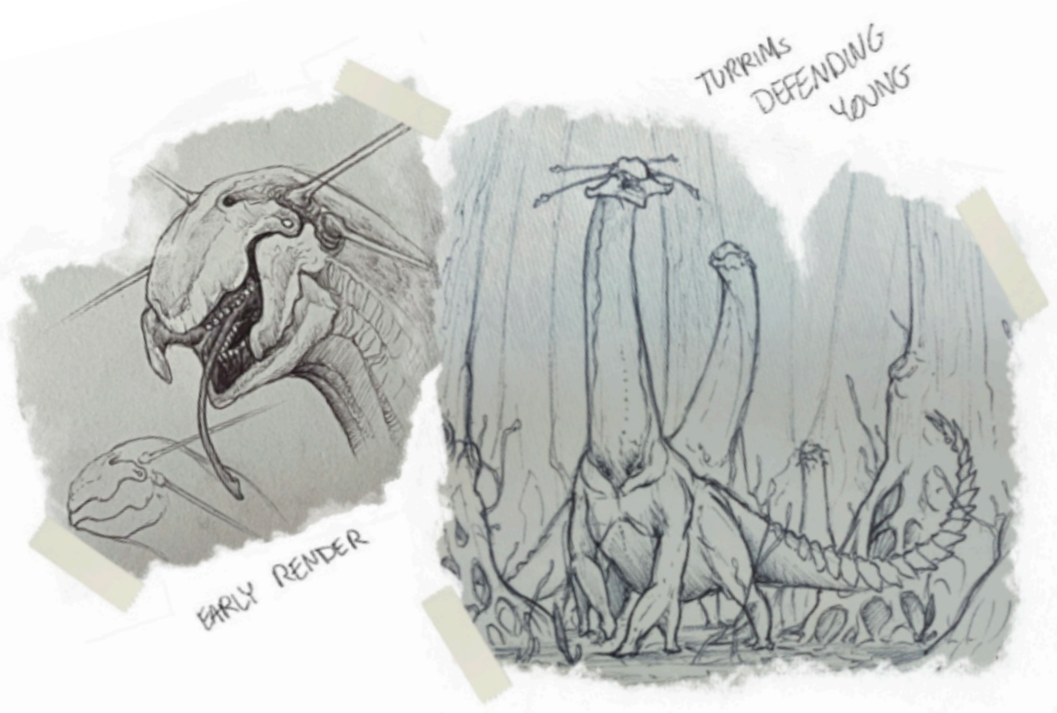


Glimpses of Vita. *The first panel (left) displays a view from a monolith, while the second panel (right) shows one of the shore's more docile predators, the shallows stalker, hunting for fish.*

Canopy Marshlands. The aptly named Canopy Marshlands are made up of thousands of mega-flora fungi called arbor mushrooms. The caps of these tree-sized mushrooms are so densely packed that they begin to fuse together. This creates a remarkable environment completely separate from the undersides of the mushroom caps. The Canopy Marshlands makes up the bulbous spongy layer of 'ground' where pools of rainwater collect; which is then supported by the sturdy stems of the arbor mushshrooms. The ground is almost entirely covered in a soft red moss, giving off the aesthetic of rolling crimson hills. Despite the higher elevations in the Canopy Marshlands, plenty of life thrives above in the clouds.

The most imposing flora found above the caps are the manus trees, which mimic the appearance of humanoid hands. These organisms grow downward from their roots, and then attach to the monoliths that reach upward from the base of the forest, and then down into the clouds. The branches of the manus trees act like strong fingers; supporting the weight of the plant off of the ground.

However, do not be fooled by the beauty of this biome; as the Mycelial Forest has a haunting secret. The arbor mushrooms thrive off of other organic matter; essentially making them somewhat carnivorous. The placement of the Mycelial Forest acts as a new form of natural selection. The forest is the only terrestrial pathway from one continent to another; creating a natural land bridge. This bridge is crucial for hundreds of species that must use it to cross land masses for migratory purposes. Unfortunately for those animals, they have yet to adapt to the unique and hostile environment of the Mycelial Forest. The spores of the arbor mushrooms are deadly to those without the proper adaptations. Once inhaled or ingested, the spores travel throughout the bloodstream directly into the brain of its victims. When spores finally arrive inside the brain, they become parasitic, and force the animal into a 'moth-like state' making the host highly sensitive and attracted to sunlight. After extended periods of time, whether it be days, or even weeks in a fungal thrall, the animals will find a patch of sunlight, either within a clearing of the forest, or on the forest's edge, and then wait there to die. The corpse of the unlucky animal sprouts a



Observational Sketches. *Pictured are the Turrim Bestia—they are massive, terrestrial organisms native to the Mycelial Forest.* *See Page 94 for more information on these beasts!*

new arbor mushroom which will consume its lifeless body. The skeletal remains of the animals are leftover to dissolve in the acidic soil, which feed the monoliths that use the calcium to form new supportive structures for the proliferation of the Mycelial Forest.

There are far too many organisms that call this bizarre biome their home; although there is one animal that stands out in recent research. See Page 94 for information about the Turrim, a large hulking beast that is the first animal to find a means to thrive in the Mycelial Forest.

The Forest Shores. *This is where the forest meets the ocean, and where its influence expands.*

SPECULATIVE RADIODONTS

BY JOHN MESZAROS — INSTAGRAM: @johnjmeszaros
DEVIANTART: nocturnalsea
WEBSITE: www.johnmeszarosart.com

Radiodonts, more popularly known as anomalocarids, were an unusual group of real Paleozoic invertebrates. They were distinguished by a set of shared features: **1.** A circular mouth shaped like a pine-apple ring (hence their name, which means "wheel-tooth"); **2.** Lateral flaps on the sides of their bodies that propelled them through the water like cuttlefish or stingrays; **3.** Three thick carapace shields on the top and sides of the head, and most distinctly; **4.** A pair of large, jointed "great appendages'' just in front of the mouth that were used for capturing food.

Many radiodonts were predators, though a significant number of them were suspension feeders including several 'gentle giants' analogous to modern baleen whales and whale sharks. Radiodonts are believed to be closely related to another ancient group of invertebrates called lobopodians—caterpillar-like organisms represented today by onychophorans (velvet worms) and tardigrades. Lobo-podians and radiodonts are further-more thought to be related to the early an-cestors of arthropods.

For decades radiodonts were only known from a few species in the Cambrian (the period of Earth's history when complex animals first appeared in the fossil record). The most well-known of these was Anomalocaris canadensis, the 'iconic' anomalocarid that most pop culture depictions are based on. However in 2009 a fossil of a new radiodont, Schinderhannes bartelsi, was discovered in Devonian-era rocks in Germany, almost 100 million years younger than other known creatures among this group.

I've been fond of anomalocarids ever since I was a kid—back when I first read about them in the book The Fossils of the Burgess Shale by Derek E.G Briggs, Douglas H. Erwin, Frederick J. Collier, and Chip Clark. Like other paleo-fans at the time, I had assumed that anomalocarids were found only in the Cambrian; weird predators from a 'lost world' of life that eventually gave way to fish, sharks,

Hermit Squid Crab.

False Ammonite.

amphibians, and other vertebrates. But the discovery of Schinderhannes changed all of that. Here was one of these weird predators still swimming around millions of years after its kind were thought to have died out. This lone fossil hinted at a vast, undiscovered history of radiodont evolution. The fires of my imagination burned hot wondering what sort of forms these creatures might have evolved. What ecological niches might they have adapted to? Here are just a few directions this lineage could have taken:

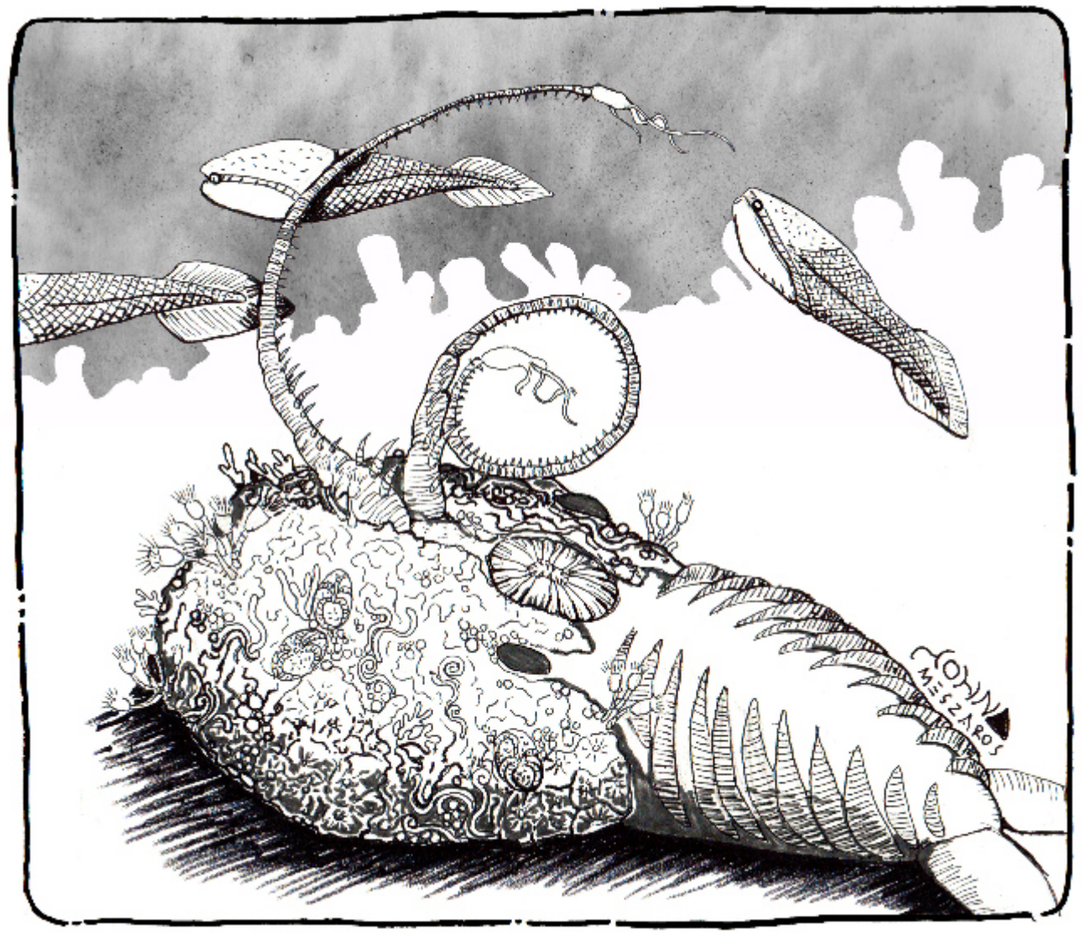
Bearded Ceticaris
Ceticaris barbus

(Pg. 32) A giant radiodont that swims the open seas, filtering plankton with its modified, baleen-like great appendages. The Paleozoic equivalent of a basking shark. When I drew this piece back in 2010 there were no known large, pelagic plankton feeding radiodonts. Since then a number of real-life fossils have been discovered, such as Tamisiocaris and Aegirocassis. I must admit I'm still rather pleased that I predicted these creatures with my humble speculative biology art!

Hermit Squid-Crab
Paguracaris diorama

(Pg. 29) Paguracaris and its relatives have developed a hermit crab-like habit of using discarded shells (in this case a nautilus shell) as protective homes. The Squid-crab drags itself along using its first pair of highly-modified lateral lobes. It is

Stone Shrimp.



Bearded Ceticaris.

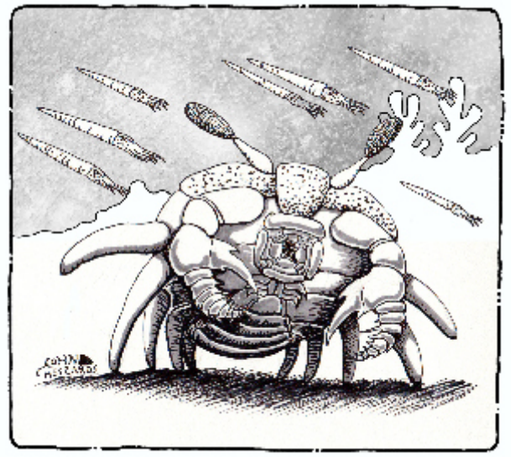
an opportunistic feeder (often scavenging carcasses), although it will also catch live prey such as this *Weinbergina opitzi* (a known prehistoric animal and a relative of the horseshoe crab).

False Ammonite

Pseudammonites ptilobrachiones

(Pg.30) This radiodonts' great appendages have evolved into massive 'brooms' that sweep plankton from the water as the animal glides along, propelled slowly by spade-shaped flippers. Much like a hermit crab (and its own distant relative, the hermit squid-crab) the creature's soft body is protected inside a discarded ammonite shell. Unlike the squid-crab, however, the false ammonite's shell floats thanks to a symbiotic siphonophore (*Megaera deformibaccata*, a relative of jellyfish) that inhabits the inner chambers. The pink tentacles dangling from the aperture of the shell are megaera's own fishing tentacles, while the orange, pear-shaped bodies around the rim are its reproductive zooids.

To the right of the false ammonite is another radiodont, the sun drifter Medusocola silvadorsum. These creatures inhabit the bells of jellyfish, where they gain protection and free transportation. They are also filter-feeders that use their elongated great appendages to snare plankton. If necessary, sun drifters can leave their jellyfish hosts and swim freely.



Wheel-Mouthed False Crab.

Stone Shrimp

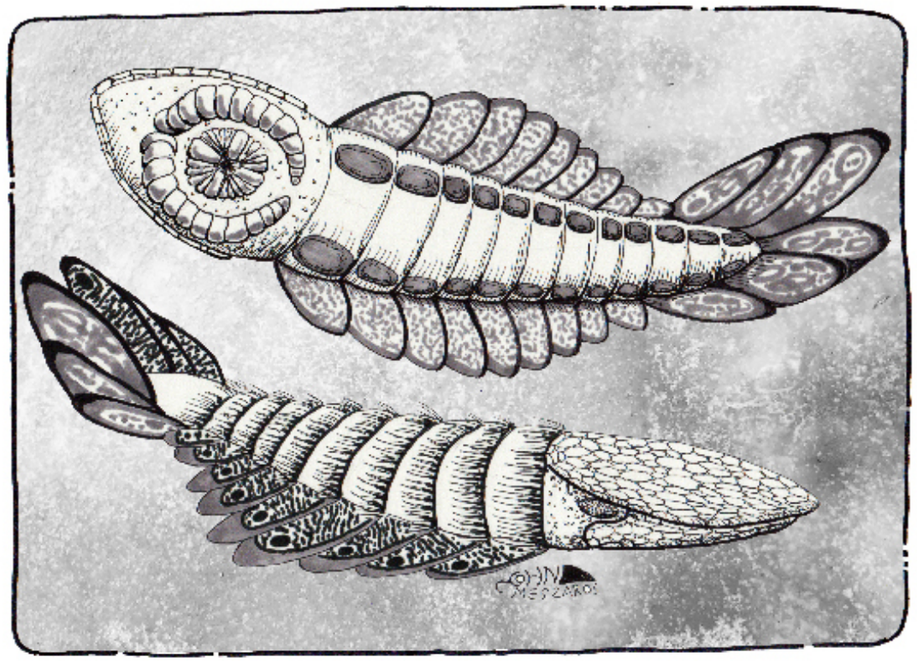
Ebisu lapiscutum

(Pg. 31) This radiodont has evolved a sedentary lifestyle similar to modern-day frogfish, monkfish, and other shallow-water anglers. It lays on its back with one of its elongated great appendages extended and waving a lure at its tip to attract prey which is snatched by its other appendage. Ebisu's rough carapace resembles coral or stony algae and is covered in anemones, entoprocts, bryozoans, sponges, tunicates and other encrusting organisms, creating the perfect camouflage.

Wheel-Mouthed False Crab

Heike pseudocarcinus

This unusual radiodont has evolved a body shape remarkably similar to that of a modern-day crab, with its great



Moustache Ghoul Shrimp.

appendages having become large, muscular claws. It scuttles around rocky shores on its modified lateral flaps, looking for detritus and living prey in the abundant tide pools.

Moustache Ghoul Shrimp
Nukekubi mystunguibus

A parasitic radiodont that resembles a modern-day lamprey. Its great appendages have been modified into flat structures that it can use to clamp and suck onto the side of prey—usually large Devonian fish. The ventral pair of body flaps have also been modified into flat flexible pads that add further suction. Once attached, the moustache ghoul uses the sharp teeth on its ringed mouth to rasp away at its prey's flesh, then uses contractions of its buccal cavity to suck out internal fluids.

Caterpillar Shrimp
Erucacaris arboreptans

These amphibious, semi-arboreal radiodonts inhabit the complex maze of prop roots in Devonian mangrove swamps, climbing about using their great appendages and tentacles derived from their three front pairs of lateral flaps. They also use their other lateral flaps to better grip branches, as demonstrated by the top individual. A set of hooks on the organism's tail adds an additional grip.

The gills of these creatures are concealed under the tough armored scutes on their backs. They can breathe out of water as long as these gills remain wet. Erucacaris is an aggressive, opportunistic hunter that will take on nearly any prey it can find among the thick mangroves—even creatures bigger than itself.

Silkweaver
Leizu vimedomus

Another terrestrial radiodont. Leizu has developed the ability to produce silk which it uses to glue together bits of twig to construct a protective house around its body. To catch prey, the radiodont suspends itself by a thick silk cord over a high traffic area, such as a wide tree branch or a protected area of forest floor. It then lays down a trap of sticky silk with several threads extending from the center. The Silkweaver holds another thread attached to the trap in its great appendages—when prey is caught on the trap, it will feel the vibrations of their struggle.

Silkweaver (top-right) & Caterpillar Shrimp (bottom-right)

Planet Agrona. *A decade-long search ended with the discovery of an alien exoplanet titled "Agrona". This planet lazily orbits an orange star and harbors complex organic life. The image above and the background image are both 3D renders of Agrona.*

PLANET AGRONA

An Alien Documentary in the Making

BY HUNTER WELCH — *INSTAGRAM: @pesterjest*
CO-AUTHORED BY DOMENIC PENNETTA — *DEVIANTART: pesterjelly*
YOUTUBE: pesterjest

Agrona, named after the Proto-Celtic river goddess of slaughter and carnage, is my speculative evolution project and fictional planet that has been three years in the making. The exoplanet of Agrona is your typical Earth analog, but with some atypical traits. The most noticeable features is low oxygen ratio in the air and high amounts of sulfur which is heavily present in the planetary crust, oceans, and atmosphere. Low oxygen levels and high sulfur create a hospitable environment that is not advantageous for life to exist. However, life still finds a way to creatively adapt to this dangerous yet interesting biosphere.

Like other spec artists, I was heavily inspired by the Discovery Channel's documentary *Alien Planet*, based on the artist Wayne Barlowe and his book *Expedition*. My project lets me connect with my creative origins, since I made plenty of alien drawings based off of Alien Planet in my youth. The first year of Agrona began mostly as just a hobby for me. I looked back at these old creature designs I made and I challenged myself to make them better. I quickly created more organisms inspired by these drawings, leading me to further develop many new taxa and complex behaviors for these animals.

For the next two years I became more invested in Agrona—and now I have fully embraced the project! Recently I have taken it upon myself to model and animate many of my creatures to produce an animated documentary in the same vein as Alien Planet. The goal is to create a full length documentary that accurately illustrates my alien world and all the bizarre creatures living within it. Afterwards, my intention is to create detailed animations focusing on particular taxa, with a focus on infographics and anatomical diagrams that further explore

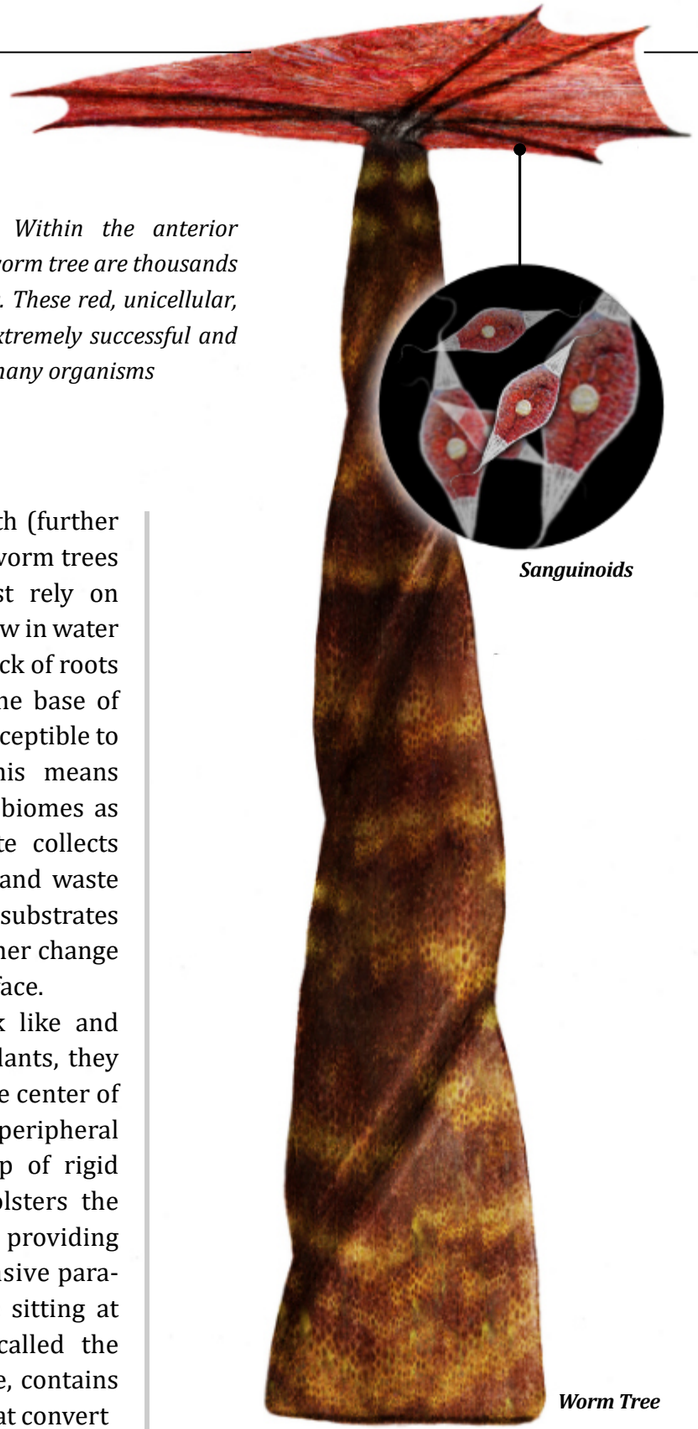
Red Jungle. *An overhead view of a red jungle biome on Agrona. Precipitation falls down upon the trees appearing as a dense "mist", which hydrates the dense bark bodies of worm trees.*

the biology of alien creatures. The documentary is currently in production, but I am happy to show off renderings of my creatures and the illustrations that the 3D models were based on.

The Worm Trees. One of the first animated scenes depicting the surface of Agrona shows plant-like organisms called worm trees. When many worm trees are located close to one-another they form a biome called the Red Jungle. Worm trees play a crucial role in many ecosystems on Agrona as they act as bioengineers that cycle nutrients and other materials in the soil (similar to modern day plants). This process is called bioturbation, and in relation to worm trees, they introduce compounds such as abundant sulfur into the ground. The Red Jungles are located near sulfuric oceans next to a biome called the Sulfur Shores. Here water is evaporated, carried by strong winds, and finally rains down on these shores to provide worm trees with hydration and moisture. Worm trees thrive in this rainy environment, processing excess sulfur, and expelling the waste materials like hydrochloric acid. The trees situate themselves using their screw-like body which produces enough torque to hold them firmly within the ground. As a worm tree grows, the apical end extends and spirals downward into the earth (further securing itself in place). Since worm trees do not have roots, they must rely on complex capillary actions to draw in water and important nutrients. The lack of roots also loosens the soil around the base of the tree; making the ground susceptible to high amounts of erosion. This means rivers form within Red Jungle biomes as excess water and acidic waste collects between the trees. The water and waste helps break down dense rock substrates to expand these rivers and further change the appearance of Agrona's surface.

Although worm trees look like and function similarly to Earthly plants, they are still technically animals. The center of their bodies, referred to as the peripheral cartilage mantle, are made up of rigid cartilaginous material that bolsters the trees structural stability while providing added protection against invasive parasites. The triangular structure sitting at the top of the worm tree, called the anterior pharyngeal membrane, contains chemosysnthetic sanguinoids that convert

Worm Tree and Sanguinoids. *Within the anterior pharyngeal membrane of a single worm tree are thousands of micrognisims called sanguinoids. These red, unicellular, photosynthetic chemotrophs are extremely successful and have symbiotic relationships with many organisms*

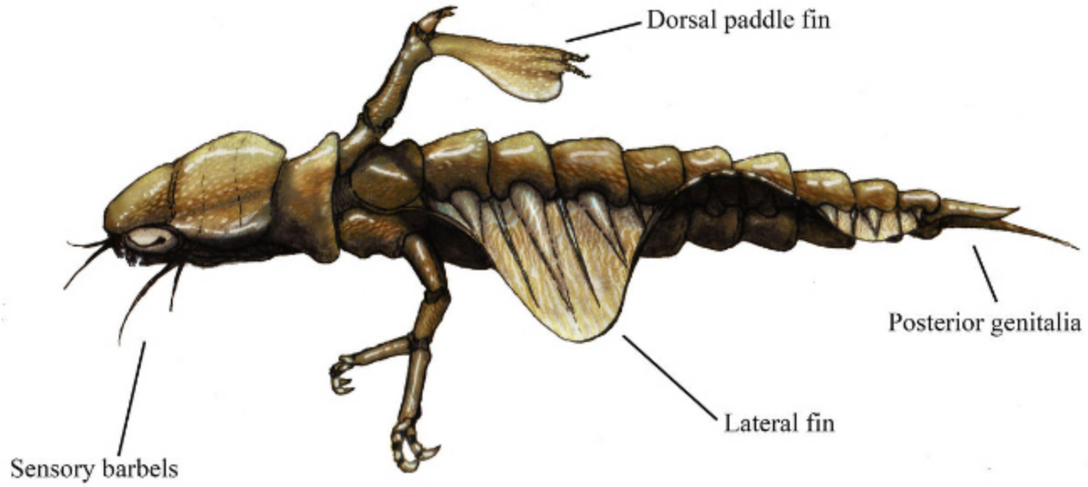


The Ruby Flopper. *Ruby floppers have two pairs of eyes, one pair in the front and one smaller pair on their back. Vision is useful for detecting potential predators and for scouting out food sources, like the bloodtongue pictured.*

Outskirts. *The outskirts of the Red Jungle biome is a visibly barren landscape. Despite it's appearance, life still thrives, taking the form of motile hemophyta called "redcones".*

sulfur compounds in the air into energy. The broad shape of the membrane maximizes the surface area, allowing sanguinoids to soak up the most sunlight for chemical processes. Worm trees also display paternal behaviors toward their own offspring; they move their membranes to allow light to pass downward to younger worm trees growing underneath.

The Ruby Flopper. A peculiar organism that calls the Red Jungle its home is the humble ruby flopper. Their role in the jungle is to relieve worm trees from harmful parasites that may grow on the moist, outer surface of their cartilaginous bodies. Ruby floppers are quite effective at this; able to detect parasitic growths from a distance using their large, beady eyes and then utilizing their mouth and limbs (which are adapted to clinging onto wet surfaces) to scale up the trees. When a ruby flopper finds an infected worm tree, it begins to climb the tree and search for pores, wrinkles, and nodules found within the tree's cartilaginous bark for food. One specific organism that parasitizes worm trees, is a macro-colony of



Spade Crab. *A lateral view of a common spade crab.*

free-living bacteria called the blood-tongues, which like to cling to worm trees and digest their cartilaginous bark to gain access to the softer, nutrient-rich interior of the worm tree. The ruby flopper then uses its mouth to suck up the blood-tongues and other harmful growths—finally rendering the tree parasite free. The relationship between worm trees and ruby floppers is one of the most distinct examples of mutualism exhibited in the Red Jungle. Ruby floppers consume organisms that are detrimental to the health of the worm tree to assist in their immunity against foreign invaders. While the worm tree provides the ruby flopper with a source of food and shade from harsh sunlight.

The Spade Crab. Sometimes seen adventuring onto shore searching for food is the spade crab. They are semi-aquatic, opportunistic scavengers that can smell a decaying corpse for miles. Spade crabs reside near river deltas formed by Red Jungles. Here they typically nest in brackish waters to form close knit families, benefiting from the highly concentrated nutrients transported

Family Ties. *Spades crabs are uniquely familiar and form tight bonds with their mates and offspring. Pictured is a male spade crab dropping a morsel of flesh for its young to consume.*

by jungle runoff. Using their claws, spade crabs collect portions of carrion to bring back to their young. They live in small family units made up of a male, female, and offspring that act similar to a human nuclear family. This means that they are a K-selected species that prefer to take care of their young.

The spade crab is the final organism highlighted in this article, but stay tuned for the release of my documentary film on April 28th, 2022, narrated by the YouTube creator Thought Potato. There are many more species to come, all animated with lively personalities and character. In the mean-time, you can check out my other videos on my Youtube channel prior to the eventual release of the documentary.

SPECIES OF THE OCEANS OF ASTRAEUS

An In-Progress Spec Evo Encyclopedia

BY N. D. CEBULA — *INSTAGRAM: @artnaomic*
TIK TOK: @artnaomic
WEBSITE: www.artnaomic.com

All regions of the exoplanet Astraeus, a terrestrial planet orbiting the orange dwarf star Epsilon Indi A, are shaped by the tidal locking that occurred long before the development of its native life. Marine environments are no exception. The shallow seas closest to the substellar point are warmed by the eternally overhead sun, while the marine ecosystems closer to the terminator thrive in the constant low light of a permanent sunset. Numerous environmental factors prevent the planet from developing vast uninhabitable zones, and a diverse array of life has adapted to each habitat's unique conditions. Finned, fish-like psarans, a wide assortment of marine worms, baloniforms that swim with siphon propulsion, crustacean-like itiaforms, intelligent and social savrathalassians, and many more classes and orders of animals inhabit the planet's marine and intertidal regions. Those species living in warmer, sunnier waters often display adaptations that allow them to thrive in ecosystems with an abundance of plant life. In contrast, the animals native to colder, darker seas and oceans have different colorations and feeding behaviors more suited to those environments.

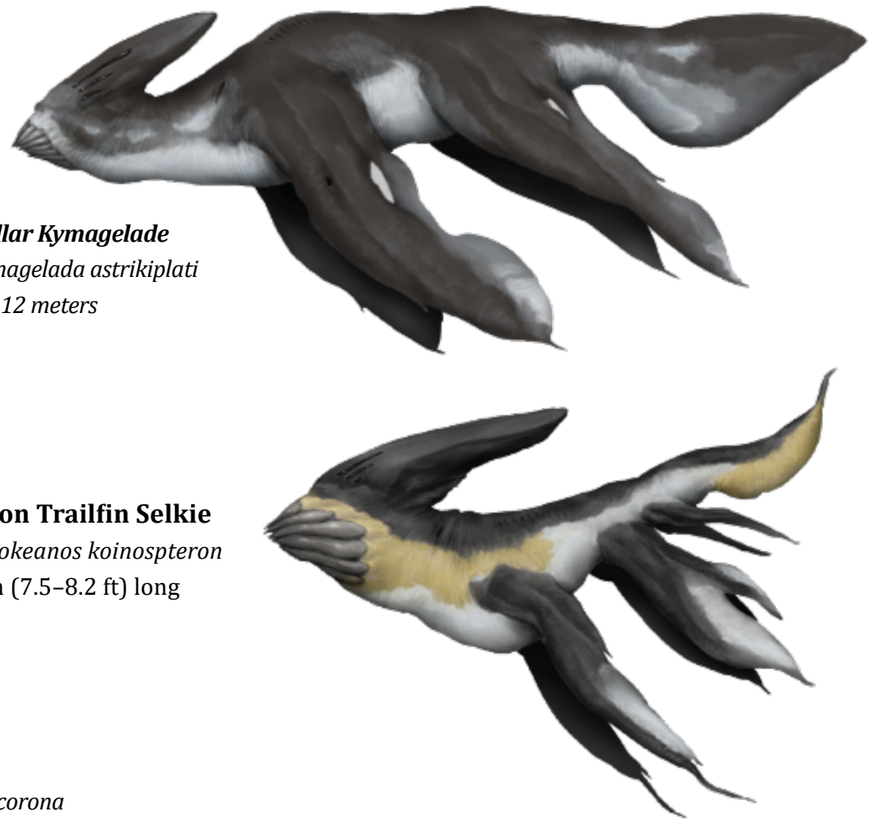
The Savrathalassians. These intelligent, social members of the phylum Xenocherius are more closely related to the early terrestrial Exoikogeneia than to the other aquatic Xenocherius class, the psarans. Like the cetaceans of Earth, this class returned to a completely aquatic lifestyle from a terrestrial one.

Stellar Kymagelade

Kymagelada astrikiplati
10–12 m (32.8–39.3 ft) long

(Pg. 46) The stellar kymagelade is a medium-sized savrathalassian native to the waters off the southwestern coast of

The Southern Ostrean Coastline. *A juvenile stellar kymagelade (lacking the fin spots of adults of its species)*



Stellar Kymagelade
Kymagelada astrikiplati
10–12 meters

Common Trailfin Selkie
Enkefalokeanos koinospteron
2–2.5 m (7.5–8.2 ft) long

Arrowhead Falan
Halifalaina sagittacorona
12–14 meters

Ostrea. Named the 'wave cow' for its distinctive black-and-white coloration, this species grows to sizes that allow them to hunt many psarans that share their habitat. Even compared to other savrathalassians, stellar kymagelades are extremely social. These animals live in family pods of between eight and twenty individuals. Stellar kymagelade pods are highly territorial and will defend their patch of ocean from neighboring pods.

Common Trailfin Selkie
Enkefalokeanos koinospteron
2–2.5 m (7.5–8.2 ft) long

Common trailfin selkies are some of the smallest savrathalassian species both in terms of length and body mass. Found in the relatively low light seas along the rocky coastlines of several temperate and icy landmasses such as eastern Ostrea and the Skadia Islands, common trailfin selkies exhibit remarkable tolerance for these low-temperature waters. Like many other savrathalassians, they are very social – the pods of this species in particular can consist of up to fifty individuals.

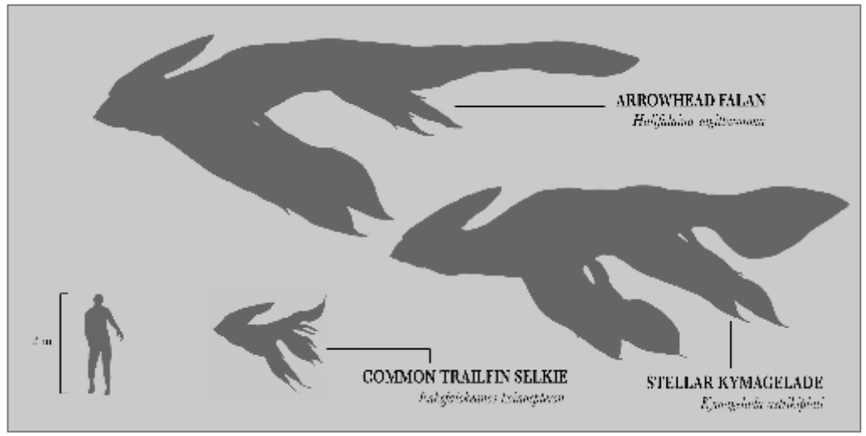
Arrowhead Falan
Halifalaina sagittacorona
12–14 m (39.3–45.9 ft) long

Most savrathalassian species prefer deep, clear ocean habitats, but the arrowhead falan is commonly found in the sea forests that grow in the shallow seas surprisingly close to the substellar point. Similar in appearance to the kelp forests of Earth, these sea forests support a host of marine species including large numbers of juvenile psarans. The arrowhead falan, surprisingly agile for its enormous size, possesses camouflage that allows it to hunt huge numbers of juvenile psarans in these flourishing marine forests.

The Ambulatory Itiaforms. These crustacean-like animals are largely radially symmetrical, though some species have developed bilateral traits and locomotion. They are most commonly found in the planet's intertidal zones, though species have adapted to many other environments including the harsh conditions of the bathypelagic.

Amber Star Hookfoot
Falcipoda mellifuscus
0.5–0.8 m (19.7–31.5 in) across (arms fully extended to sides)

(Pg. 49) The amber star hookfoot, despite lacking the ability to swim long distances like fully pelagic itiaforms, is almost never found on the ocean floor. Rather, these thin organisms anchor themselves in the lower foliage of warm-water sea forests. Their stick-like bodies are easily mistaken for underwater plant life, and they use their vibrant blue, prehensile mouths to



Savrathalassian size comparison. *Comparison of these species' sizes with a 2 meter tall human reference. Two of these three species exhibit gigantism, which offers some protection against the largest*

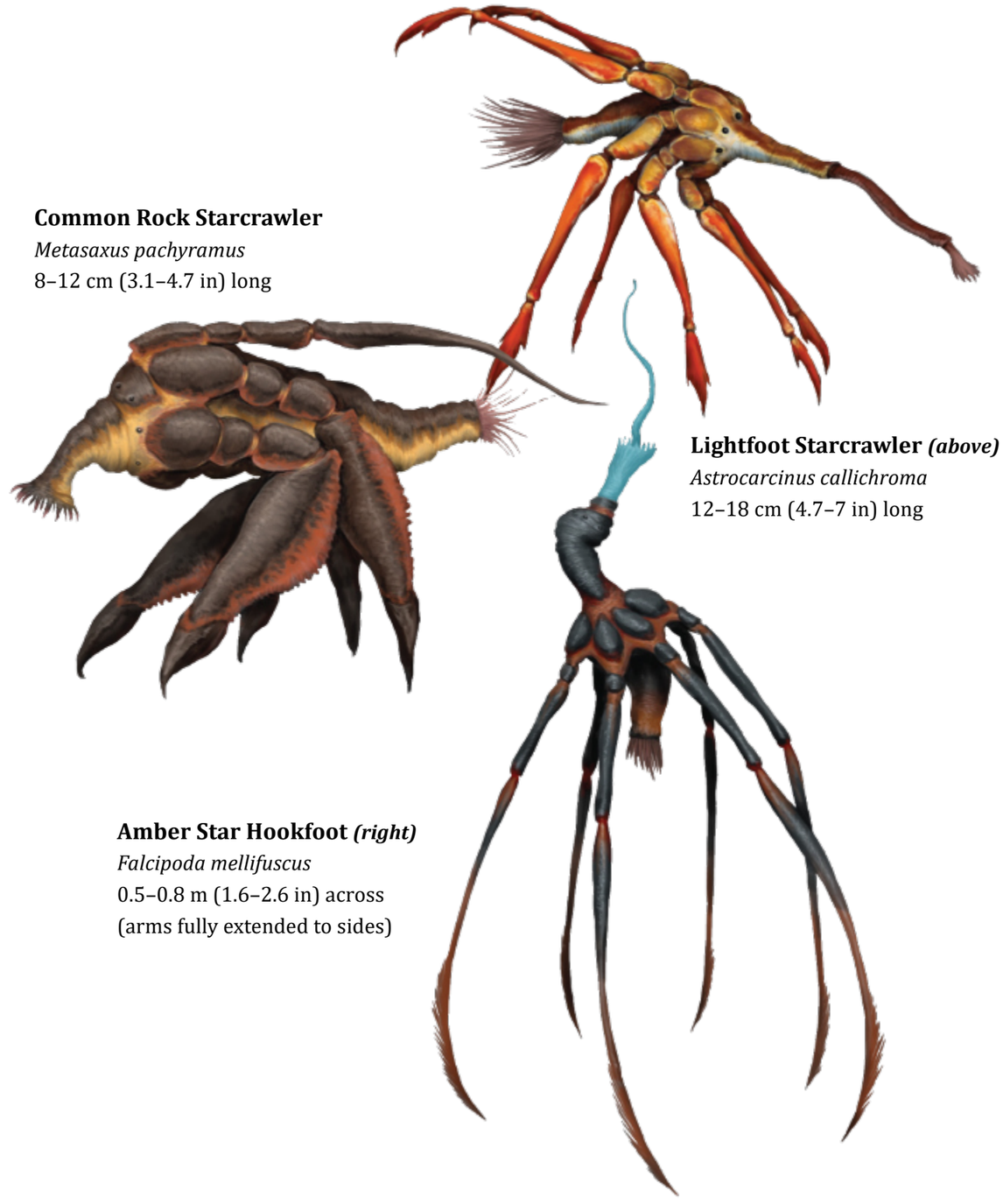
to attract and ensnare small, unsuspecting juvenile psarans.

Lightfoot Starcrawler
Astrocarcinus callichroma
12–18 cm (4.7–7 in) long

The lightfoot starcrawler is a species of ambulatory itiaform of the order Podiastria, which developed bilateral traits and locomotion despite the radial body plan. Lightfoot starcrawlers are endemic to the volcanic dayside Lymer island chain, and feed primarily on algal growths. Their bright coloration does little in the way of camouflage, instead serving to attract mates. To avoid predators like the coastal avians living on the Lymer islands, lightfoot starcrawlers spend most of their lives in the intertidal zone, hiding in the volcanic rocks' cracks and crevasses.

Common Rock Starcrawler
Metasaxus pachyramus
8–12 cm (3.1–4.7 in) long

Found along the western coasts of both Teshaw and Chareff, the common rock starcrawler has the largest geographic range of any observed ambulatory itiaform (including the true radial itiaforms). This wide range can perhaps be attributed to both the adaptability of its diet and the effectiveness of its camouflage. Common rock starcrawlers consume both plant and animal matter; additionally, they are very effective scavengers. It is not uncommon for low tides to reveal large psaran carcasses covered in common rock starcrawlers.



Common Rock Starcrawler
Metasaxus pachyramus
8–12 cm (3.1–4.7 in) long

Lightfoot Starcrawler ***(above)***
Astrocarcinus callichroma
12–18 cm (4.7–7 in) long

Amber Star Hookfoot ***(right)***
Falcipoda mellifuscus
0.5–0.8 m (1.6–2.6 in) across
(arms fully extended to sides)

Extraterrestrial herding. *Two animals have ran away from their herd. Two valachs are chasing them, guiding them back into their territory.*

THE SALAŠ PLAINS OF TEMERE

BY MICHAL JANOVSKÝ — INSTAGRAM: @mickin.speculative.bio
WEBSITE: www.tambaqi.wixsite/mickinart

The salaš [sah-lash] plains found in the tropical belt of planet Temere are, at first glance, reminiscent of the savannas of Africa. Upon closer inspection of the planet's surface, large organic structures dot the landscape; which resemble Burmese pagodas or inverted pyramids in appearance. Surrounded by numerous animal herds and orange groves, these striking structures grab our attention.

The towering giants sometimes exceed 60 meters in height; they are the koliba trees—a keystone species of this warm region. Without them the lush orange salaš plains would lose their fight against desertification. The thousand-headed animal herds would not be able to survive here, at least, not all year long. Grazers and air sifters migrate as the wet and dry seasons change. Some species stay in one place for the whole year; a noted anomaly in this regular cycle. This multispecific community is collectively known as the barance [barant-seh]. The koliba trees replenish the groundwater deposits with water that condenses during dawn and dusk on their gigantic canopy. Growing concentrically, the branches function as a fog net directing water towards openings at their basis. It then flows through a system of canals into underground cavities created by the tree's roots. Animal waste is then incorporated; and the plentiful microbial communities transform the waste and water into a fermented soup. This life-giving substance further seeps into groundwater to be used by other photo-trophic organisms of the salaš plains. Herds of barance gather around the koliba trees to graze on the orange vegetation which thrive for the entire year (thanks to the implementation of this fluid fertilizer).

You might ask where the animal waste comes from. The answer lies within the

koliba trees. The waste is produced by the inhabitants of the tree's hollow trunk—species of eusocial animals known as valach [va-lakh] which are named for their striking lifestyle that shares similarities to Slovak sheep herders of centuries past. A mutualistic relationship has evolved between this species and the koliba trees. Colonies of valachs find shelter in the hollowed areas inside the tree's massive trunk in exchange for their waste and dead bodies; a source of nutrition and minerals for the gargantuan phototroph. The entangled ecological relationship does not end here. Valachs protect and herd barance in exchange for food (similar to ants and aphids). To better understand the relationship, we must take a look at the origins of this mutualism. All species of barance have one trait in common. Evolution gave them the ability to undergo larval stages inside of an enclosed structure—a cocoon that is connected to the body of their mother which helps the young survive arid environments. This multi-layered cocoon can house several larvae at once; each having their own compartment filled with shock absorbing fluids. The cocoon itself is produced by a highly developed set of silk and cement glands surrounding the cloaca. Over the course of millions of years the opportunistic ancestors of valachs started to use the opportunity to snack on these cocoons. Barance were losing their young, but at the same time, the ancestors of the valachs started chasing other plain dwelling predators away. From this point it was only a few steps away from the relationship we observe on the salaš plains today.

Outside the mating season the barance produce false cocoons that contain nutritious pseudo-placental layers and fluids just like the real one (but these false cocoons are not fertilized). Barance also grow an array of brightly colored bristles around these false cocoons; the so-called 'rear mane' sends a signal to valachs that the cocoons are ready for harvesting.

When their mating season comes, barance simply shed their rear manes and grow them back once they reproduce successfully. This lets valachs feed on the cocoons in a way that does not threaten new generations of barance. In exchange for nourishment, valachs protect the barance from predators such as the Tyrannosaurus-sized rahang besar.

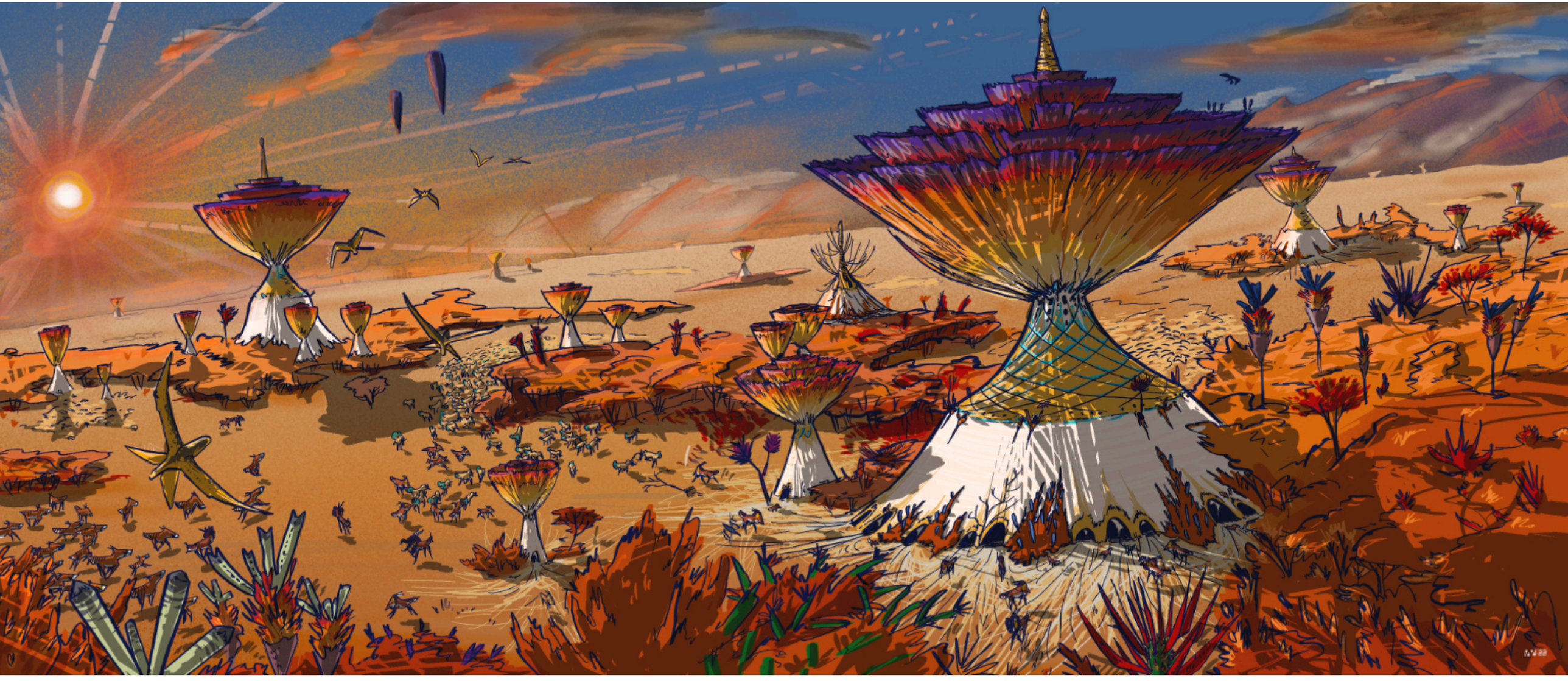
The complex relationship of barance and valachs has given rise to an interesting form of kleptoparasitism. A species called potmehúd [potmeh-hood] has evolved to closely mimic the appearance and scent of some of the barance species. Potmehúds feed on barance cocoons and their young by virtue of their deceiving appearance; allowing them to live undisturbed as a part of the herds. It is quite ironic that the animal that harms the valachs is at the same time protected by them within the herd. The need for organized collection and storage of barance cocoon juice forced the valachs to evolve eusociality. The valach castes are made up of:

There is always a Bigger Fish. *Valachs are a powerful force which completely rearranged the ecological relations of the plains. Though they are not always the rulers; large predators like rahang besar are important regulators of barance numbers.*

a.) The gazdiná [gaz-deenah], the queen caste and mother of almost all members of the colony.

b.) The bača [ba-chah], the king caste and father of the colony.

c.) The povaľač [pov-alach], the worker caste; their function is to prune the koliba tree's inside growths, coordinate the colony's innerworkings, and move build-ing materials. Old povaľačs reside in the gazdiná's chamber and look after the next generation. It is interesting to mention that these workers leave specific bite marks on the tree that carry messages for other valachs in the colony. These messages are often directions for other workers, amounts of required food, or other general commands. This means that the valachs are the first known species on Temere to use any form of writing system after the extinction of the planet's sophonts millions of years ago.

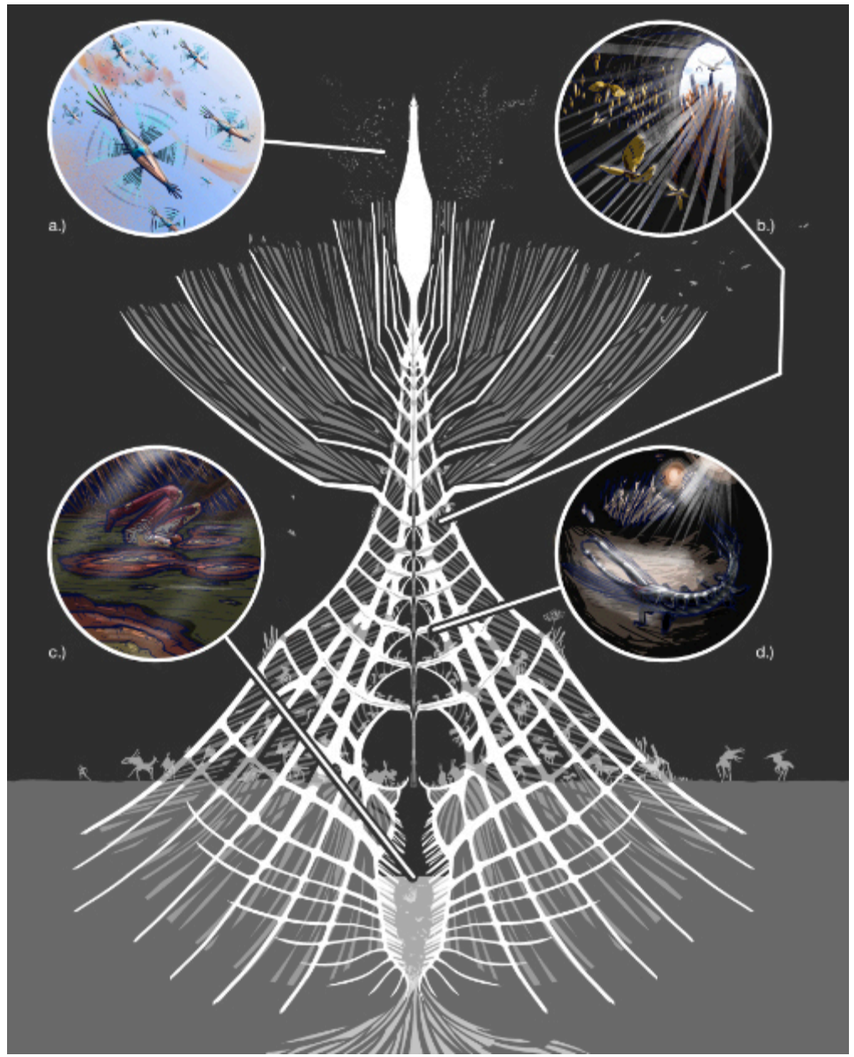


The giants of the plains. *Majestic Koliba trees tower over the alien landscape. Many lifeforms call these plains home; be it temporary or a permanent one. Capturing moisture, the trees are true ecosystem engineers of this biome; without them desert would consume much of this region.*

d.) The baraniar [bara-nyar], the soldier caste, who are the protectors of the colony and the barance herds belonging to it.

e.) The ovčiar [owh-chyar], the collector caste, arguably the most important of all valach castes. These strong individuals collect false cocoons from the barance. With the help of symbiotic micro-organisms living in their crops, these collected false cocoons are turned into a substance called 'bryndza' [bryn-dzah] which serves as food for all members of the colony. When ovčiars become too weak for herding they stay inside the koliba tree while their crops enlarge and serve as living storage for the bryndza. Every 3 to 15 Temeran years the koliba trees grow the strobilus—a several meter high fractal reproductive structure. Once ripe, a myriad of pores on its surface crack open, releasing clouds composed of millions of reproductive zooids. These zooids represent an active, flying life stage of the koliba tree that hints at its once motile ancestors. The goal of the zooids is to catch floating photosynthetic aeroplankton known as 'zore'. Once the zooids have caught enough zore, the sound sound of wind whistling on the strobili of other koliba trees guides them towards zooids of the oposite sex. Zooid

The Peaceful Harvest. *One barance individual can grow several false cocoons in one season if the conditions are favorable. Valachs begin collection of cacoons, which is accompanied by socialization and interspecific communication; albeit not as complex as that within the Valach species.*



Life in the Koliba tree.. *Apart from the Valach colony the tree's hollow trunk is home to many for other species and communities. Depicted are a.) The reproductive zoids flying during the mating season in dense swarms, b.) colonial flyers nesting in the hollows of the canopy, c.) fungi-like microbial communities in the underground cavities decomposing the animal waste and dead bodies and lastly d.) a millipede-like creature possessing large pincers that inhabits the hollows too narrow for Valachs. It is a beneficial neighbor as it feeds on the Valach parasites.*

The Royal Dance. *Young bača, the future king offers the conjoined zoids of a Koliba tree to the future gazdiná, queen of the new colony. Impression of the bača's mesmerizing dance is only amplified by the sight of one of planet Temere's moons.*

pairs mate and conjoin similarly compared to that of the flatworm *Diplozoon paradoxum.*

The Gazdiná of the colony is able to sense chemical signals of the koliba tree when it is ready to release zooids. Subsequent changes in her hormonal activity cause gazdiná to give birth toyoung bačas. Reproduction of the two species occurs simultaneously due to codependency—the tree needs a valach colony to live inside of it, and the young bača needs to catch conjoined koliba zooids to begin a new colony. The conjoined zooids have bright colors and are willingly caught by young bačas after they are expelled from their old colony. 'Zooid catching' is often accompanied with ferocious fights among the young bačas. Conjoined zooids represent an essential sign of the young bača's fitness. After a successful catch, the last component for starting a new colony is for the bača to find a future queen.

Young bačas travel through the countryside to find other valach colonies. Many are unfortunately attacked and killed by soldier castes from these foreign colonies. The lucky bačas try to lure a female worker, called 'dievka' [dee-yevkah], outside of the reach of her colony's chemical signals. When the two individuals are safe, the bača performs a mating dance using his colorful front limbs resembling bird wings. If the dance is successful, the bača gifts the zooids to dievka. This is the ultimate catalyst for mating to ensue. After the act is done the future royal pair must run away from their parent colonies to start one of their own. They plant the zooids at a location with the best possible conditions (out of reach of other related valachs). This is the most vulnerable state of the new colony since the female is pregnant and the pair lives in a simple burrow. The koliba tree is not yet large enough to serve as their home and must be protected from herbivores. Around the time the tree is large enough to accommodate the pregnant dievka the first members of the new colony are born. Growth rates of the tree are rapid to house the ever expanding number of valachs. Once the population of the new colony stabilizes, the growth rate gradually slows down. The bača and dievka (now considered a gazdiná) lose their eyesight, as both individuals no longer require sight in the perpetual darkness of their chamber.

The discoverer of this species wrote in his diary:

> *"The king and the queen become blinded by their love".*

The old bača and gazdiná eventually give way to the newcomer royal pair. After decades their ruling dynasty must be revived, the old cycle ends, and a new one begins—ensuring the fragile balance of the Salaš plains is maintained for ages to come.

MULTITUBERCULATE EARTH

BY CARLOS ALBUQUERQUE — INSTAGRAM: @mullerornis
WEBSITE: www.multituberculateearth.com

In the end, evolution is nothing short of random—the winners of the game of life often arbitrary. Imagining worlds where something as drastic as the extinction of the non-avian dinosaurs or, more rarely, the absence of the Permian Great Dying are excellent exercises for the imagination. But across the world's history there are background extinctions just as impactful and far more mysterious.

One such example is the extinction of the multituberculates. These ancient mammals are superficially rodent-like (but exceptionally weird by our placental/marsupial dominated standards) and were the most successful mammalian lineage of all time; lasting for over 130 million years. They were the most common and diverse mammal group both before and after the extinction of the non-avian dinosaurs; if mysterious groups like the gondwanatheres are multituberculates as well, then their temporal range potentially doubles further into the Cenozoic. Yet, their diversity quickly plummets just before the end of the Palaeocene and results in a few relictual lineages that withered off gradually. The standard hypothesis is competition with rodents, but some studies actually seem to indicate that placental mammals as a whole were restricted by multituberculates; needing their initial decline before our ancestors could Thrive. So one wonders—what if this decline did not happen?

Multituberculates are nowhere near as charismatic as dinosaurs (as far as pop culture is concerned), but they were already doing impressive stuff in our world. The North American Taeniolabis taoensis and Belgian Boffius splendidus, for example, are among the largest mammals of their Palaeocene environments. The former was a beaver or wombat-like animal that might have weighed somewhere between 30 and 100 kg, while the latter was inferred to

Ectypodus arctos. *A depiction of Ectypodus arctos, a real-life multituberculate species, consuming a basal rodent. (Credit: Illustration by Dylan Bajda)*

be wallaby or kangaroo-like most likely due to its relations with the hopping djadochtatheroideans. If unimpeded, it is clear animals like these would have led to a remarkably different and wondrous world.

The divergence point is the mid-Palaeocene. Here, whatever caused the initial decline of multituberculates did not occur, and instead they continue to diversify as usual. It is therian mammals (i.e. placentals, marsupials and any other group sharing a last common ancestor with these, such as the extinct tamirtheres) that decline, placentals in particular declining rapidly while metatherians (marsupials and their closest relatives) will keep going in a few

Marginal Niches. By contrast, multituberculates, gondwanatheres and meridiolestidans (an unrelated lineage from the southern continents, whose story in many ways mirrors that of multituberculates, down to giant Palaeocene forms in our timeline like Peligrotherium tropicalis) undergo a golden age, and quickly produce megafauna unlike anything our world had to offer.

In deliberate contrast to most "what if dinos survived" projects, we do not

A Drunk Ptilodontoidean. *Such a scene is hardly depicted in paleoart (or frankly at all). A Ptilodontoidean consumed a bit too much fermented fruit containing alcohols that have intoxicated the creature. (Credit: Illustration by HodariNundu)*

begin with an alternate present, but rather, work our way through time seeing the very history of the age of mammals radically changed by the presence of multituberculates. A pivotal moment is the absence of an Azolla Event; here, marine relatives of Taeniolabis have taken to the Arctic Ocean, feeding on the floating plants and preventing mass scale CO2 sequestering. This results in a prolonged hothouse planet, starting a cascade of events that alters far more than just the mammalian fauna. For now, the project is set in the Oligocene era, and already things are odd with gondwanatheres on all continents, massive flying mammals with wingspans of seven meters (whose wings are unlike any seen before in vertebrates), enormous marine reptiles, and birds that can chew. I intend to fully reach the present, so the journey has many twists and turns ahead.

On the Artistic Process. Unlike movies or TV shows, speculative evolution projects can be a one-man act. They don't always have to be (many within this magazine are group projects after all), but there are many high profile artists who can get by on mostly solitary work and having full control over how their creatures look or what is illustrated. I consider myself an artist too… but as a writer. I can't draw, and I've tried for years, but my motor skills simply aren't developed in this way. I was diagnosed with Asperger's syndrome, but I believe this has nothing to do with my condition and may instead be a neurological issue yet to be identified. Point is, to do this project, I have to rely on others for visual depictions of creatures, and thus I have no luxury of being a sole auteur.

Pteroectypodus falco. *This illustration was commissioned long before I had the project in mind, as a hypothetical "feathered mammal", and I incorporated it into the project neatly. Although this specimen isn't related to the flyers alluded to in the article. (Credit: Drawing by Diego Ortega Anatol)*

Right off the bat I knew that not everything would be illustrated, or at least it might take years for everything in this project to have an associated picture. I did pay for some commissions which fit neatly into my Multituberculate Earth, so I recycled them in a way. Most, like the aforementioned feathered mammal and Ectypodus vs rodent, were vague flights of fancy that finally found their true purpose here.

Thankfully I've found a few new artists willing to do original art, so at last several species will finally get their illustrations (some of which are in the works right now). In general, my updates are erratic and unlikely to be consistent or predictable, so my equally unpredictable funds for new art fit perfectly in this progress method.

While I haven't yet gotten any requests, I do give the artists some liberty to interpret the designs and even work alongside their ideas, as for instance the entries on the mammals of the Santa Lucia Formation. I do feel like this is a bit of an auteur project, but I'm not above suggestions and contributions made in good faith.

Do Your Homework. To conclude, I'd like to stress the value of research. I pride myself for being able to keep up with updates on more obscure extinct groups, a task much easier said than done, since this requires deep diving into literature and navigating across hellish search engines and paywalls. In the end, I will probably get a few things wrong or outdated, but I think I've managed to create a scientifically plausible world inhabited by creatures that could be as real as elephants and oarfish.

Speculative evolution projects are thoughts in exercise, but are also creative enterprises; so self-expression is unavoidable. My interests lay bare, and so I can work harmoniously. Same with every other speculative evolution project, they harmonize and synthesize science. You'll find that realism is not hard at all.

Wawa sp.

Many Mammals. *A menagerie of Santa Lucia Formation's mammals. In our timeline, this Bolivian site bears some of the earliest marsupials; in this timeline, the Cretaceous/early Palaeocene gondwanathere/meridiolestidan faunas continue uninterrupted, leading to spectacular Creatures. (Credit: Illustrations by Palerelics)*

Alicantotherium rigobelli

Potentioperadectes vastata

Chibchalutra finalis

Sacadelphys sp.

Kuzcotherium elegans

Xenotamandua allocaellus

Hosca brusca

Tumi yumi

Allqu uyam

Baroauchenia canifacis

Glyptoguy sp.

Beachcrawler Ambush. *A suggestive image of a young L'lmanü boy being ambushed by a Horrendous Beachcrawler, Aigialotherium olethrotyrannus, while on his way to a neighboring village roughly 32 million yeas ago, at the end of the Tovneri period.*

ON THE NATURE OF ENETODONTS

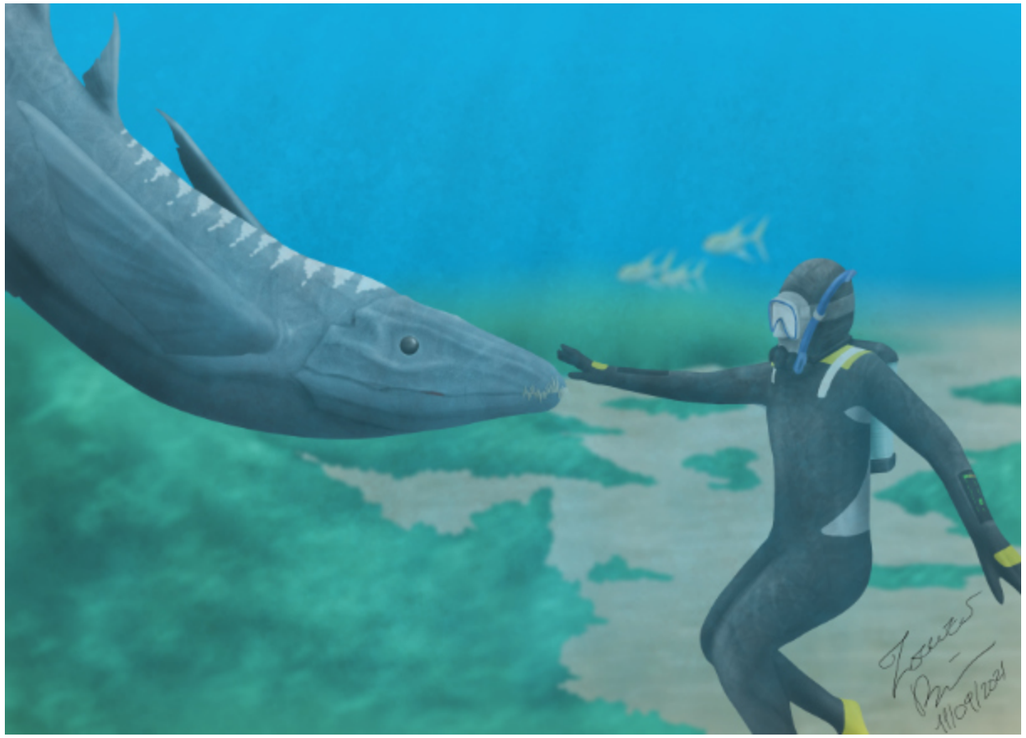
BY LORENZO BATTILANI — *INSTAGRAM: @nijin_official*
DEVIANTART: blackfrog96

Perhaps the second most alien-looking superclass of Ichthyomorphs on planet Nijin-Konai, the Enetodontians, remain a staple of the planet's ecosystems and a uniquely recognizable clade among the more conventional-looking aquatic organisms. But how did these weird tube-mouthed animals come to be? In this article, we'll explore the natural history of the bizarre Enetodontian lineage.

The Entedontians. Enetodontians first appeared in the fossil record 163 million years ago, in the Late Neygambean Series of the Niivneri period. The first Stem-Enetodontians weren't too dissimilar from their fish-like ancestry, with their major defining adaptation being their namesake—a series of maxillary dermal teeth characterized by an inner canal through which the animals were able to inject chemicals into their prey. Although the fossil record can't tell us what the types of chemicals injected into prey were at first, extant basal Enetodontians, like *Enetodon tremens*, can offer a unique window in early Enetodontian evolution.

Enetodon tremens injects into its victims digestive enzymes through the needle-like teeth, waiting for it to start the process of liquefaction of the soft tissues before ingestion. This type of extra-oral digestion characterized the group during its early stages, with evidence of some of the smaller species stockpiling their pre-digested foods in what appeared to be their nests, in a uniquely Enetodontian fossil assemblage type known as Thanatonidolite.

Entedontian Evolution. It wasn't long before the end Niivneri mass extinction event that the Enetodontians saw massive evolutionary radiation—as the previous dominant clades were decimated and left many ecological niches open for the taking. At the beginning of the Tovneri period, 142 million years ago, we see the sudden



Enetodon Play. *A shot taken in 2463 off the coast of the Terran Union of a Scuba diver being approached by a playful young Enetodon tremens. Although the animal holds the status of apex predator in its environment, it remains particularly playful towards humans and will often socialize and follow divers to play with them.*

increase in Enetodontian diversity as they started expanding their reach where the Emuraenids and Pressionatatians once dominated. It was around this time that the first Paleostomi began to appear; among their unique adaptations, we saw a shift in their hunting methodology.

No more the Paleostomi relied on the fragile needle-like teeth, easily shattered by their prey's dorsal armor; the Paleostomi now hunted using a set of derived endocranial injector teeth, with well developed, soft, prehensile palatine muscles to envelop their prey in a death grip. This grip would allow these teeth to simultaneously inject their enzymes into their prey at hundreds of different areas at once. To allow the animal to swallow captured prey whole, the mandibular symphysis was undone, allowing the

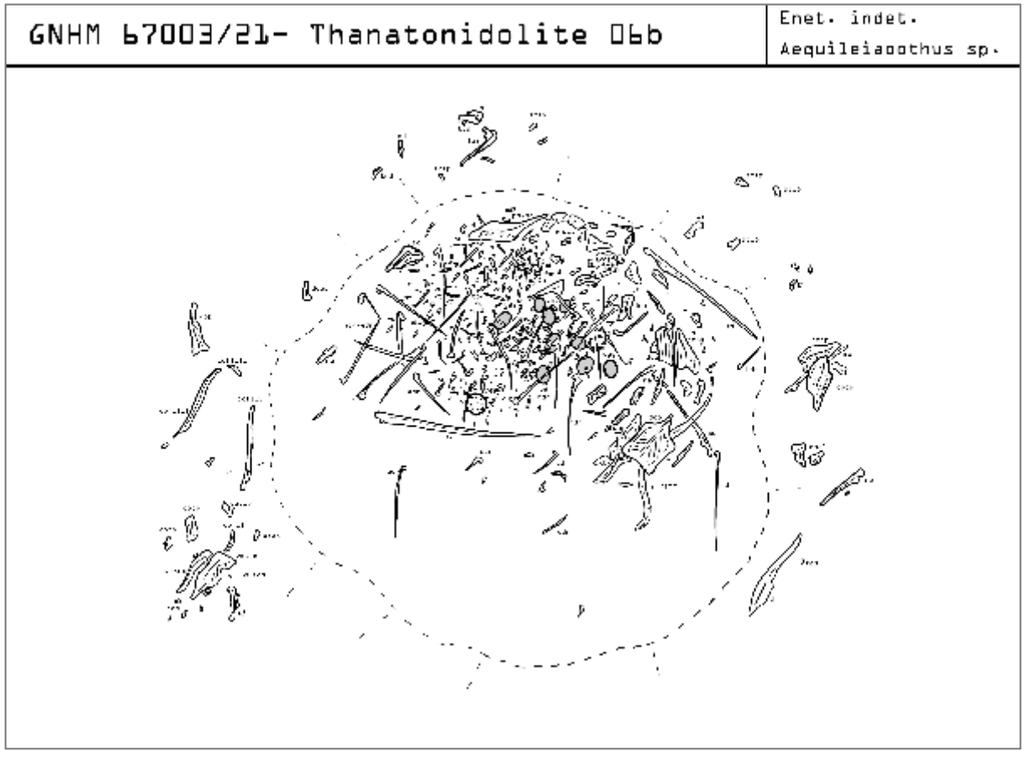
Enetodontian Variety. *A collection of some extant, non allochronic, Enetodontians from the planet's oceans. 1.) Upticaris rastrignathus 2.) Araneomonstrum phobos 3.) Krinicephalus dirhii 4.) Sifonostoma lazarus 5.) Paragigantophtalmus machairoma 6.) Chichi chichi 7.) Istiognathus gravataglossum 8.) Kugawa velis*

organism to split its jaw in two and create a larger space to house its victims.

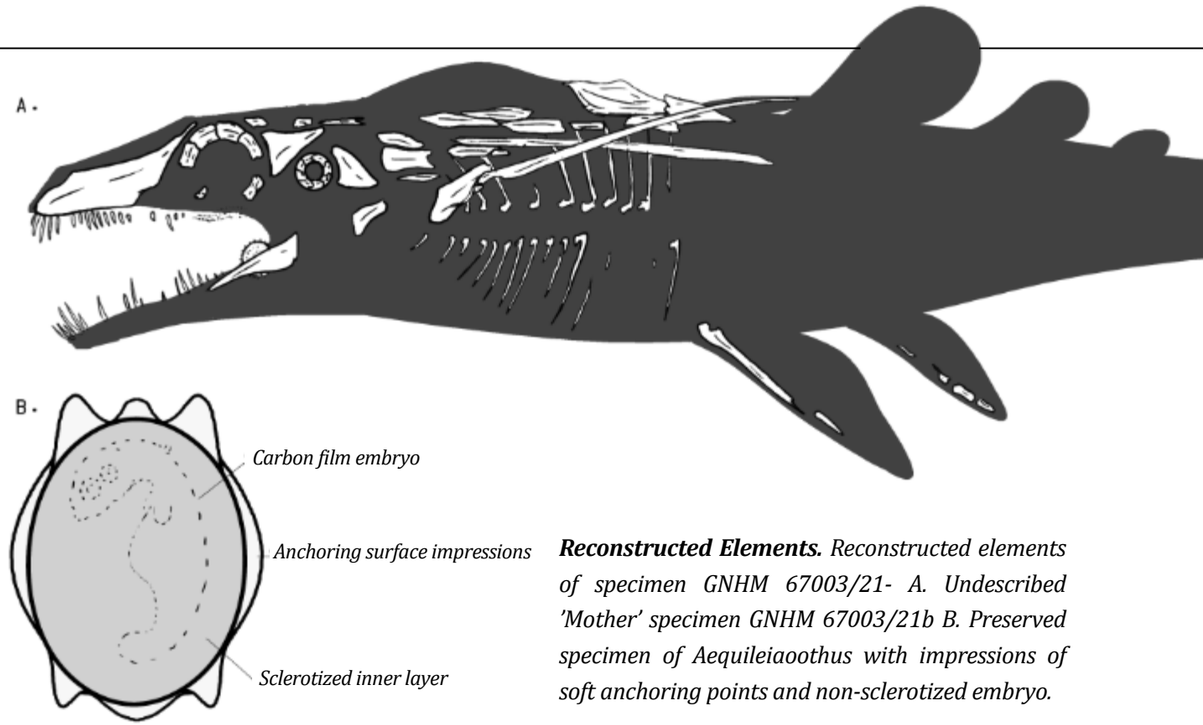
128 million years ago we saw another great milestone in Enetodontian evolution: the first appearance of a prototuberculus. To extend their reach beyond their mouth cavity, these Paleostomes started to slightly prolapse their oesophagus, losing most of their dermo-endocranial teeth and permanently undoing their jaw. The oesophagus of these animals acted not too dissimilarly to that of a chameleon tongue, propelling it quickly out of their mouths to catch prey. Soft distal sections of the prototuberculus would act as an expandable

sac that would envelop prey and start the external digestion through the usage of enzymes emitted through the reinforced inner tissues. This adaptation would mark the beginning of the Enetodontian dominance of the Tovneri period.

Diversification and Feeding Strategy. 114 million years ago marks the great Enetodontian explosion—when they became prevalent in the fossil record worldwide. The next big development in Enetodontian evolution came with the shift in feeding strategy. Tubercula became progressively longer and prehensile and the jaw lost its original function along with the total loss of teeth. Not only does the loss of the teeth help in saving up precious carbonate molecules, a scarce resource on the planet, but the permanent opening up of the jaw frees the palatine ear from its otherwise disadvantageous spot.



Thanatonidolite. *Schematic of specimen GNHM 67003/21, a Thanatonidolite from the southern Joufeian coast. The fossil preserves both 'Mother' specimen, eggs and remains of prey outside the nest border. Elements have been labeled following the International Standard of 2538*



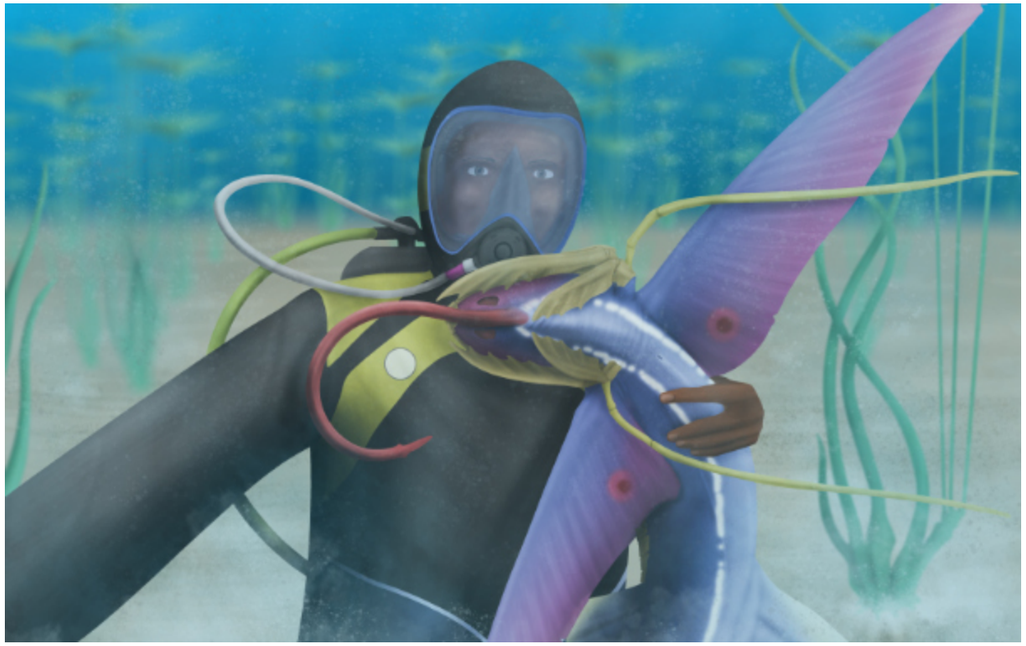
Reconstructed Elements. *Reconstructed elements of specimen GNHM 67003/21- A. Undescribed 'Mother' specimen GNHM 67003/21b B. Preserved specimen of Aequileiaoothus with impressions of soft anchoring points and non-sclerotized embryo.*

Now the palatine ear was free, the organism could make use of its full functionality with no drawback in feeding deafness (like the other ichthyomorphs it lived alongside with). With superior hearing capabilities and carbonate efficient cranial anatomy, the Paleostomi were now able to claim their absolute dominance as the most common macropredatory organisms of their time—becoming enormously more common on the planet compared to Pressionatatians, Brachicephalians, and the already dwindling Eumuraenians.

By chambering their stomachs, the Paleostomi were able to differentiate their gastric fluids into dedicated outer and internal digestion chambers. The story of the Enetodontians, however, doesn't end here as they then split into different buccal morphologies. The Gymnocephalians were the first and most primitive of the derived tuberculus-feeding Enetodontians. Gymnocephalians went a step further in carbonate efficiency by completely reabsorbing their dermal armor and losing their jaw. They then split into two major groups:

1.) Tetanognathids with reinforced tubercula, which created a stiffer structure able to withstand greater stress from forwarding motion while foraging.

2.) Extant Tetanognathids are primarily scavengers and hunters looking for prey burrowed under the sand by using their

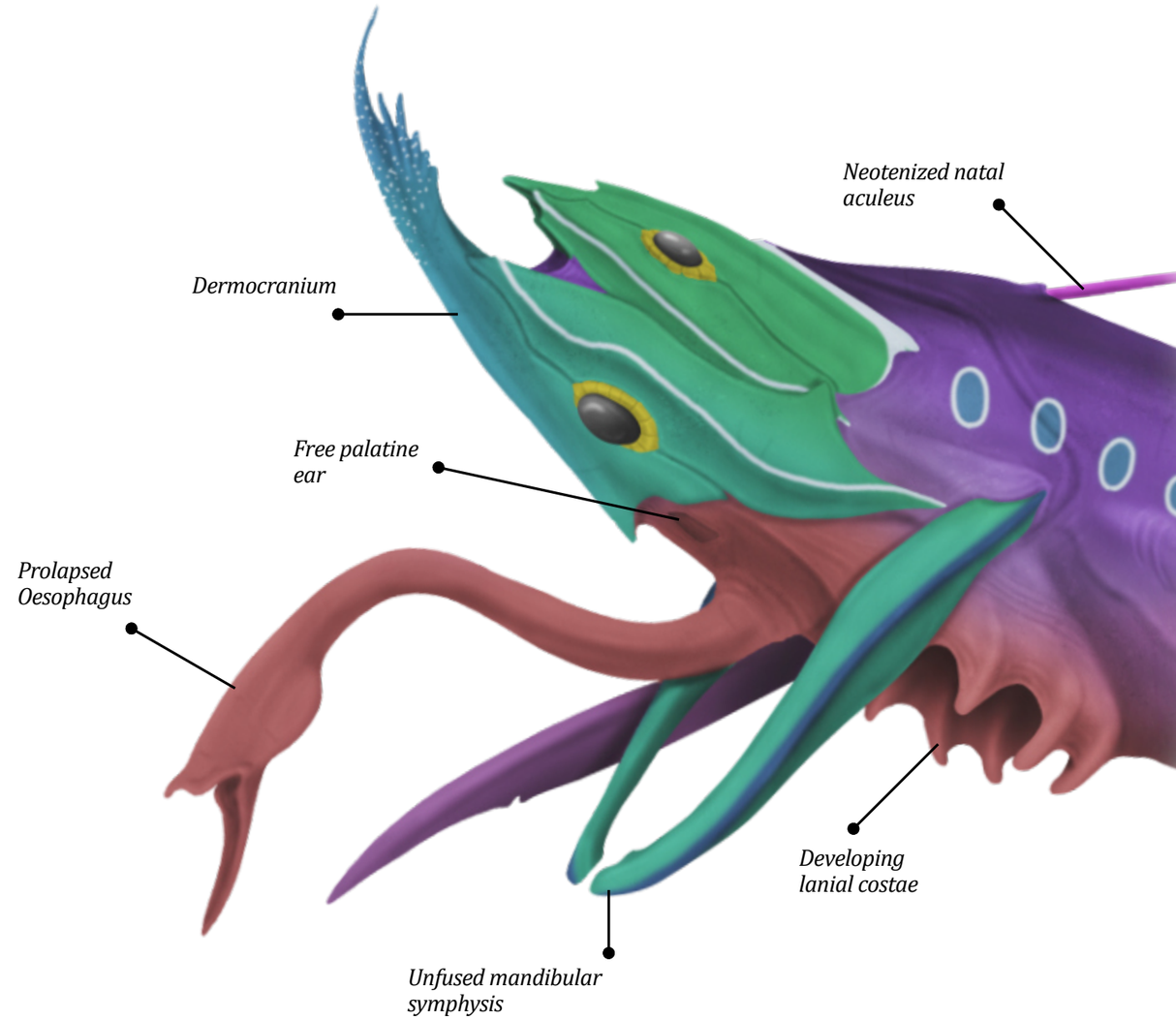


A Dance with a Friend. *World renowned selfie of scuba diver Vatsal Abimelech Ag Amar'l with a male Golden Face Kugawa, Kugawa zirconicephalus, with whom he has been friends with for the past 15 years.*

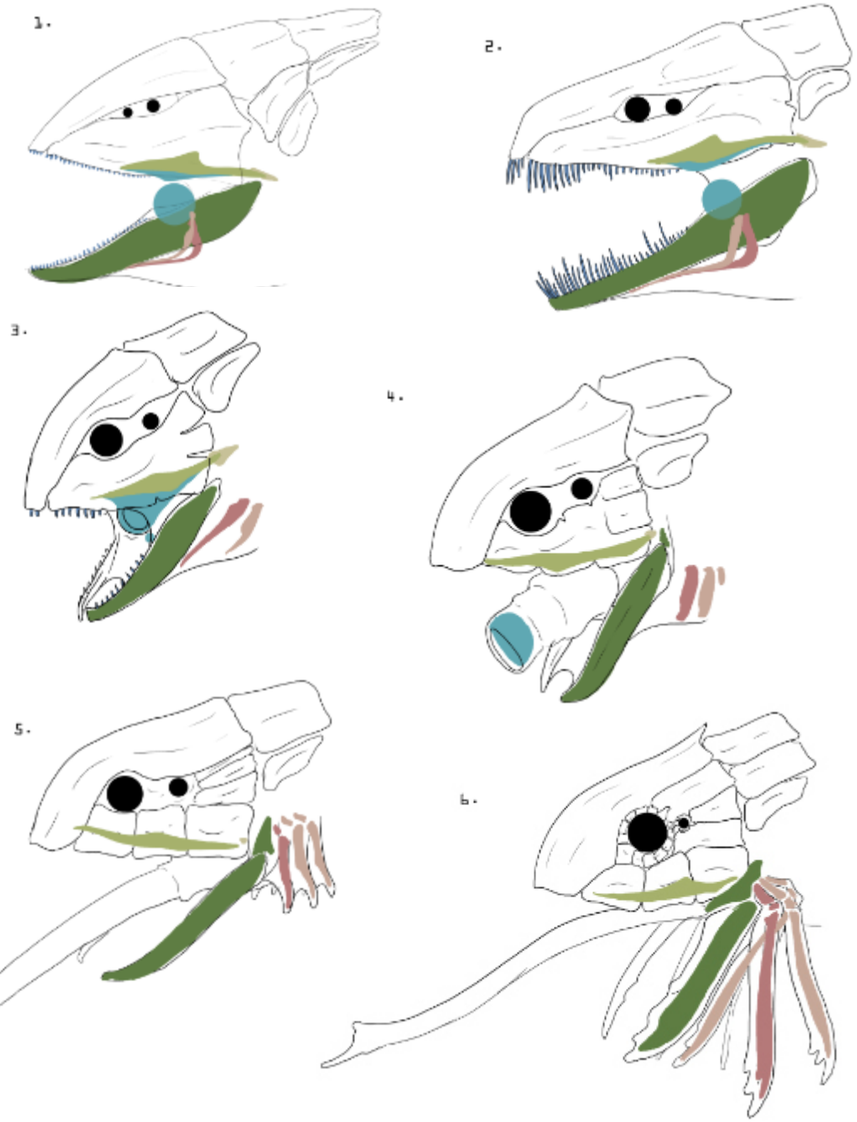
stiffened tubercula as a plough.

Amalognathids who kept the plesiomorphic (primitive) prehensile tubercula, that was adapted for a more active lifestyle. The Extant Amalognathids are mostly ambush predators that employ a hit and run technique, using a quick jolt of their tuberculus to perforate prey, inject gastric fluids before fleeing (an exception to this would be Myktirivelines, as they remain among the last omnivorous Enetodontians on the planet to this day).

The second major group to develop were Premnogenoids, which are almost completely extinct today. They employ a more nuanced approach by segmenting the jaw into several subsections and using a uniquely adapted set of motile Gingival muscles (m. adductor gingivalis) to articulate it. Today, the only living Premnogenoids are Truncopiscids and Araneogenids. Premnogenoids, aside from extinct clades like Peltonotids, are usually characterized by short tubercula with very limited mobility, and employ their segmented mandibles to bring food towards it. Peltonotids were unique



The Paleostome Buccal Apparatus. *A schematic of the typical Eutuberculate Paleostome based on Allochronic species Auchenopoda biops, notice the unfused mandibular symphysis and free Palatine Ear. The relatively short Tuberculus terminates in an external digestion sac, where prey is flooded with the enzymes.*



among the Premnogenoids for their usage of the long tuberculus to forage for food they would store inside a cranial chamber created by the fusion between the Protomaxillo-massenteric plate (before the flooding of the latter with gastric fluids).

The Tubercolostomatosids. Finally, Tubercolostomatosids, the most prevalent clade of Enetodontians even to this day, produced a far more advanced buccal apparatus than the previous two. Tubercolostomatosi developed long and retractable prehensile tubercula able to coil around their prey, bringing it near to their mouth where two to four sets of mandibles (derived from the jaw and the lanial costae) grab and keep them constrained while the animal injects its gastric contents inside it. The evolution of Tubercolostomatosids is perhaps the best recorded among the several major groups of Enetodontians and the easier to understand (given the range of extant morphologies still visible to this day).

The Lanial Costae, once part of the Lanial Apparatus (which was lost in Enetodontians) was developed further outside of the ventral region of the head, where they once functioned in the actioning of the Sphaera Lania.

At first, these extra sets of mandibles were used to make prey adhere to the bottom of the head through constricting muscle motions. This was more efficient as grasping apparatuses, leading to the eventual development into the several sets of mandibles seen in modern-day relatives, which seem almost indistinguishable from the actual jaw rami (although microstructurally very different).

In the case of more derived members like the extant Kugawas, the last pair of mandibles even lost their predatorial function and developed into a sensory organ used in electroreception due to specialized foramina along its length.

Tubercolostomatosids also derived their cranium to a much more lightweight build by atrophying the Anterojugal and Maxillary bone and opening the ocular canal through the extreme enlargement of the arched diastema.

This change offers less rigidity to the endocranial structure in favor of stronger dermocranial plates, freeing up further the tuberculus, and allowing for it to achieve better mobility while hunting and making the animal lighter for more agile movements.

After the Tovneri mass extinction event 32 million years ago, most Enetodontians went extinct before the rise of Eoichthyans took place. As Pressionatatians reclaimed some of the niches they lost to Enetodontians and Eoichthyans, quickly filling their shoes. The Enetodontians of today are a reminder of their former glory, as they ruled the ocean for a hundred million years.

ARTIST'S SPOTLIGHT

By Michal Sadowski (Ycyprid)

THE YAETUAN SAGAS

Thanking the Community & A Book Reveal!

BY CHRISTIAN CLINE — *INSTAGRAM: @christian_cline*
WEBSITE: www.christianscreations.com

Before giving an update on my recent work, I want to say that I am happy to say that the journey of my first book has gone well. Despite operating on the most negligible budget, and employing the help of free avenues of promotion (like Instagram and YouTube), my book has sold over 2,000+ copies, and this number is still growing! I would like to thank everyone who has bought my book and supported my art, and I encourage you who have yet to purchase a copy to definitely consider it! As I continue to promote my projects and also expand more on my universe, I wanted to spotlight a special project that I, and many others, have long anticipated. For a few months now I've been working on a new long-term project—one which the provided illustration will lend some insight.

"This scene is part of the more well known era of Yaetuan history, from 4,000 years ago roughly to the present day. Here, about 3,200 years ago, the home-world's World Alliance was racing to evacuate hundreds of millions off the planet, but at the same time, stay behind to try and reverse the adverse climate change that has begun to cripple their world. Over the last 3,500 years or more, the World Alliance, Yaetuan settlements along the asteroid belt (known as the Asteroid Force), and settlements on Yaetu's sister planet, Yedid, all contributed centuries of manpower and resources to create the first extrasolar vessels, along with coordinated efforts to minimize pollution and reverse global warming.

In space above the planet, enormous, miles-long generation ships were in orbit. Constructed in the outer regions of the solar system over several decades, these spaceships were at the time beginning to house their first passengers. Between the

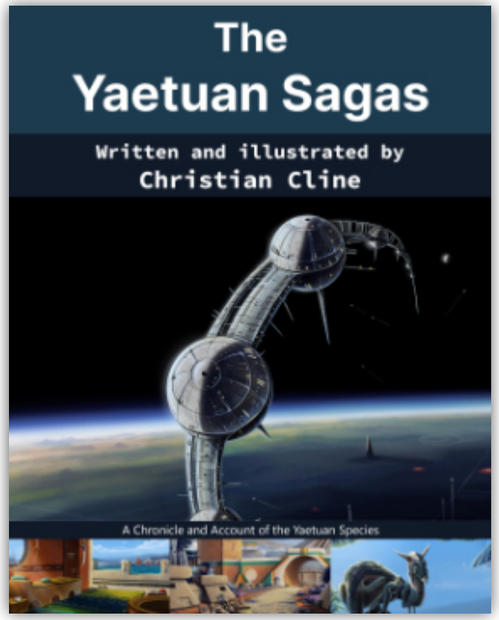
Villa by the Sea (bottom). *An intimate illustration of Keni, a Yaetuan artisan, resting in her home situated on the coastal frontier city of Eleykus. Note the ornate bed, green and yellow rug, and wall art.*

Titanic Engines. *Constructed above the Yaetuan homeworld is a gigantic spaceship that can house millions of passengers. These ships would dart off at light speed to find new exoplanets to inhabit.*

350 million people (specially selected for their genetic, mental, and physical health), would be conscripted for this one-way journey. Along with the inhabitants aboard, there are seed labs, numerous species of plants and animals, bacteria, terraforming equipment, and more that would be carried via shuttle to help assist the crew in creating a viable environment on the other side of the galaxy.

These ships, called Titanic Engines, would later dart off at faster-than-light-speed to four selected exoplanets, which would later be colonized and terraformed over the next several hundred years. Planetside, above the smog and smoke blanketing much of the mega-cities, are several smaller shuttles which would in phases transport Yaetuan people and supplies to the engine. As the world and its smaller

This is an excerpt from a newly planned, large project similar to the *Teeming Universe: An Extraterrestrial Field Guide.* In fact, I have been in the early planning stages of my second book, tentatively called "*The Yaetuan Sagas".* This book, as the name may suggest, is a detailed exploration into the history and cultures of the Yaetuan species, both past and present—something which I have been exploring a lot more since my first publication. The first book has been an introduction of sorts to the Teeming Universe's universe, giving lengthy spotlights to a myriad of worlds across the galaxy. Now that the universe has been established in book one, this subsequent book will go much further in depth on the last planet presented, Yaetu, and its species. Having officially announced these plans, I am very excited to show you more and more of my work as it continues to progress over the coming years.



Book Cover. *Here is a concept for the front cover of the successor to The Teeming Universe focused on the biology, history, and culture of the Yaetuan race.*

VEKNOR'S ARTISTIC PROCESS

Speculative Evolution & Continuation of Ideas

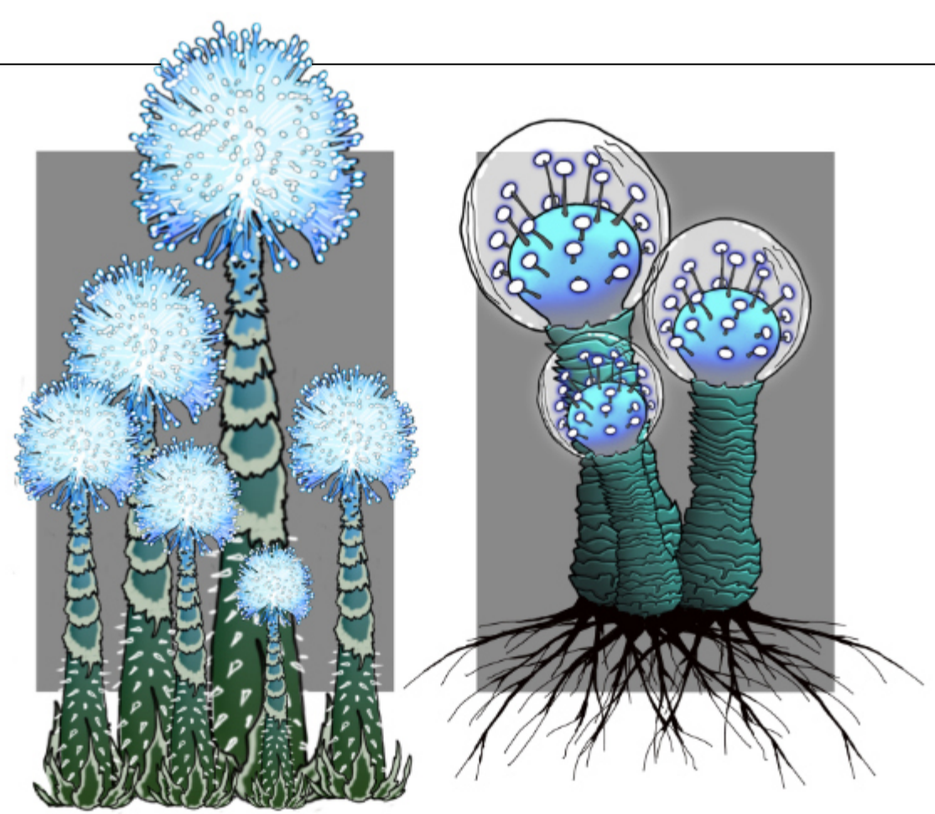
BY VEKIA — *INSTAGRAM: @species_of_vekia*
DEVIANTART: species-of-vekia

In the first issue of *Astrovitae Magazine*, I presented an overview of my project titled *Vekia: The Life-Bearing Moon*. Although this moon is now home to many terrestrial and aquatic creatures, as well as a few new biomes, I chose to focus this time on a specific family of flora instead of providing a more exhaustive summary of the world's latest developments. You can also check out my Instagram and DeviantArt pages to learn more about these new biomes and creatures!

In my work, I have chosen to create groups and lineages of creatures that share similar traits to show a more plausible side of their speculative evolution. This makes it easier to immerse yourself in the imaginary world that is Vekia. When I design a new clade, I go back to my previous designs and try to build upon them; that is to say, I try to give clades who share the same evolutionary roots similar characteristics, features, and adaptation mechanisms. For example: all Quadrivalvidea have blue eyes, yet no Quadripteran has antennae, and the vast majority of the animals who share the same design or body plan have a mouth that protrudes from their skull like a goblin shark. This process helps connect the clades visually to one another.

I clearly draw my influences from the real world; and I do not try to hide that fact. I never delve too deep into body plans that are very different from anything we would find on Earth. The clades on Vekia are unique, and yet, somewhat familiar. I try as best I can to make my creatures inspiring and truly original (given the Earthly constraints set in place to restrict their overall design).

The family of plants featured here, the Caulifructiferiphytea ("fruit-bearing stem"), evolved from a mutant form of seaweed-like organisms that developed a primitive root-like function from its holdfasts. These 'roots' supply themselves with water and minerals when stranded on Land. After eons, the offspring of these organisms eventually developed bundles of vascular tissue in the stem, and a waxy cuticle for protection against desiccation.



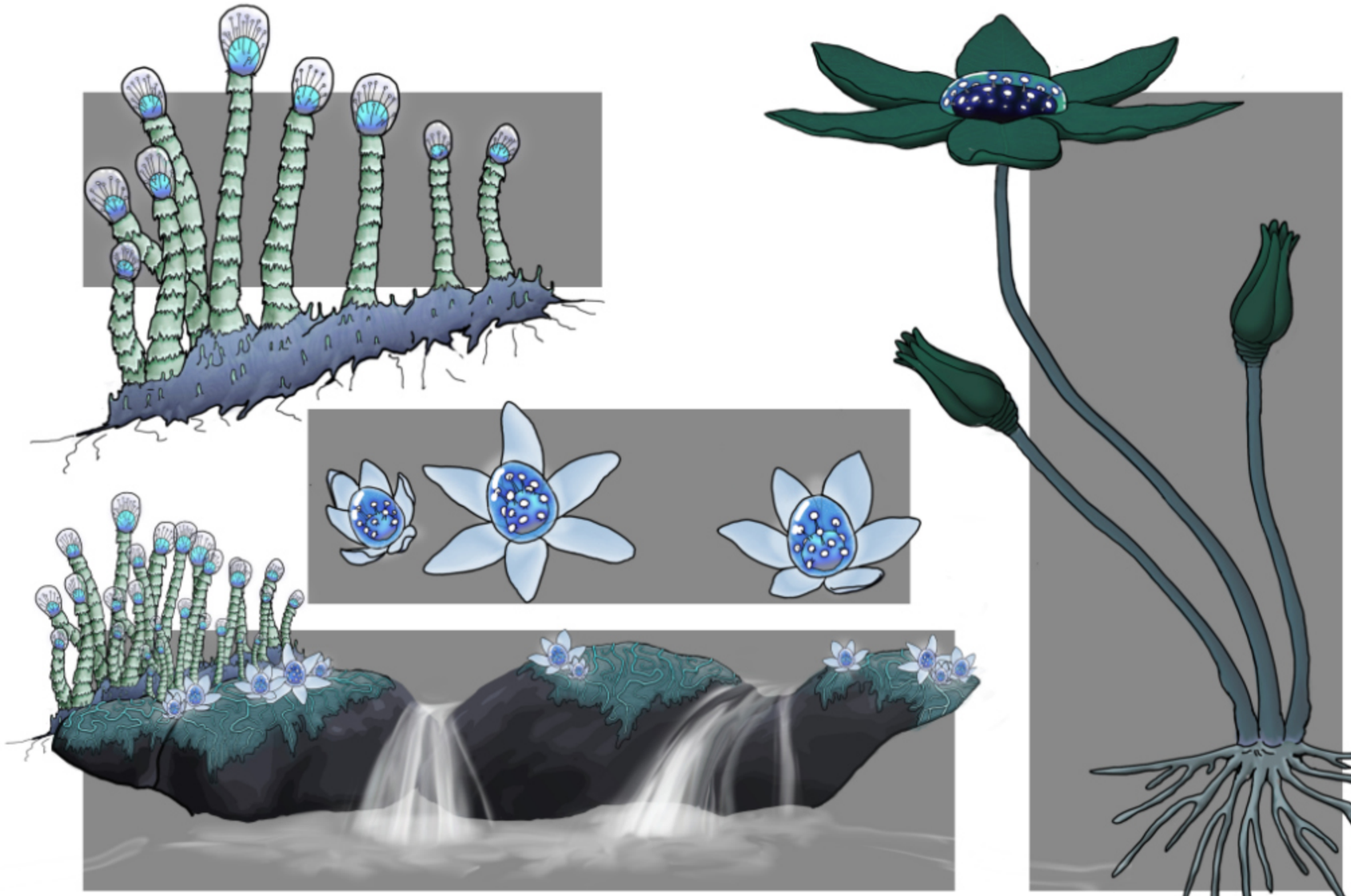
Two Medium-Sized Caulifructiferiphytea. *wo plants of the Caulifructiferi-phytea family from the forest wetland biome. The first plant features hundreds of tiny fruits while the second grows a huge, single fruit.*

One of the directions that plant evolution has taken on Vekia, in this particular family of flora, is to produce a photogenic-stemmed plant that is very well adapted to places with little sunlight. The stem absorbs much of the sun's energy (even under the dense canopy of the forest and in the shade of towering rocks). This family of plants will eventually be represented in all biomes, continents, and in every region of my world. The three most distinctive features of this family are:

a.) The distinct absence of branches and real leaves.

b.) A trunk that grows in a telescopic way.

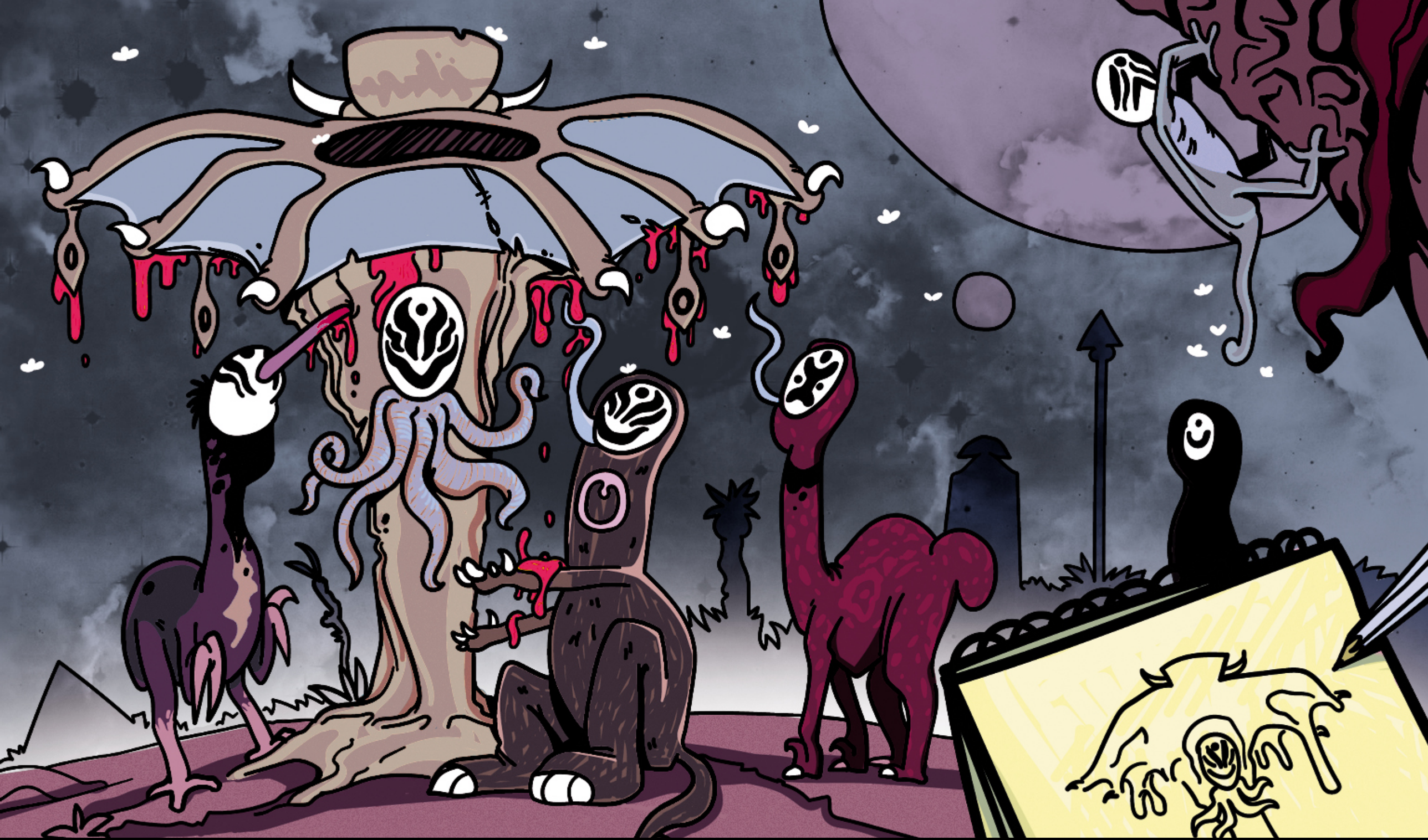
c.) The delicious exotic fruit that grows at the tip of the stem.



Three Small Caulifructiferiphytea. *A collection of small plants of the Caulifructiferiphytea family from the forest wetland biome.*

To reproduce, these plants grow nutritious fruit which is full of rich, sweet oil and spores that many Vekian animals are then able to consume. Although the spores can be dispersed by the wind when the fruit falls and rots, animals usually help disperse the spores through their droppings. I also wanted to fill my world with fruit that looked alien and weird, but still seemed plausible in some form. In my opinion, the fruit probably tastes like and has the same consistency as blueberries; but the design of the fruit's interior is still unfinished. There would be too many variations and significant structural compositions that would create differences in tastes. Thus, that aspect is left entirely up to your imagination.

This project shows the various clades of the Caulifructiferiphytea family that I have designed thus far; from the smallest species–to the largest. Some plants produce a single fruit–while others hundreds. I truly hope that you will enjoy this sneak peek into the design and thought-process of my plant designs. If you have any ideas relating to this flora family yourself, then feel free to send me your design on Instagram by tagging #caulifructiferiphytea or #Vekia.



CREATURE COMPENDIUM

By Michal Sadowski (Ycyprid)

THE CRESTED SNOUT SKIMMER

By Doink Yoink

Above the acidic oceans belonging to planet Zelos DY1242021, also called ‘Zelos d’, flies the crested snout skimmer, Nebulaphilus elephas. These unusual, aerial beasts soar high in the sky—expertly navigating around the turbulent storms that rush over the planet’s eight oceans without warning. The crested snout skimmer possesses an elongated, elephant-like appendage on its face that is used to grasp objects. It swoops downward to catch unsuspecting prey that resides at the ocean’s surface. The snout of the creature has evolved to withstand the harmful acidic water that may otherwise be inhaled and wreak havoc on internal organs. When an individual has caught its meal, it will store the carcass in its third gullet while it finds a suitable place to roost, and then it regurgitates the partially digested flesh before consuming it once again.

TOKABI

By Maryana Simpson

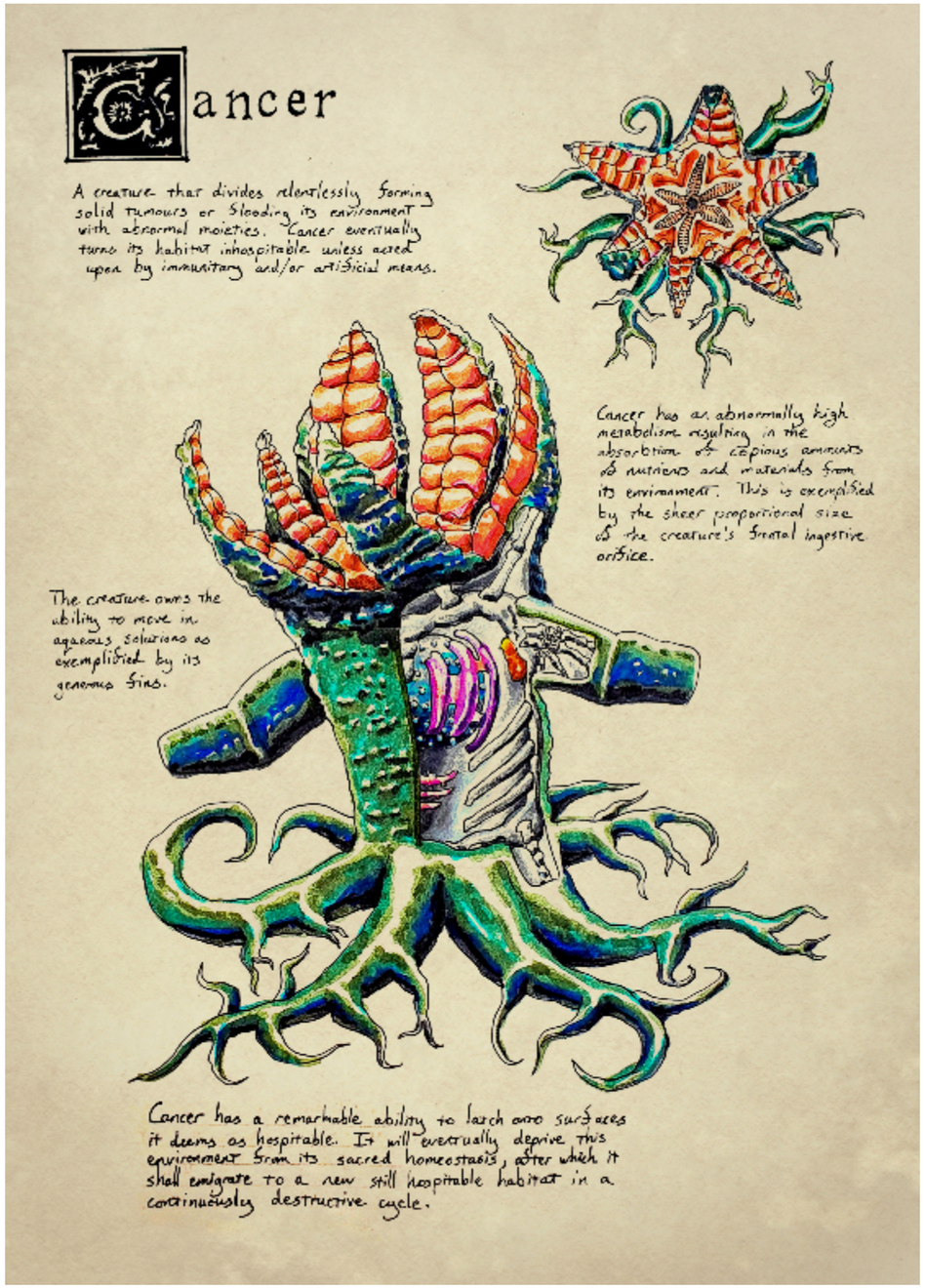
Traveling in herds across the Equatorial Desert of the Earth-like exoplanet Kahlanea, Tokabis are large, armored animals with beaks and plumage that superficially resemble those of Earth’s flightless birds. Currently the most successful lifeforms in their ecosystem, they are built for life in the desert with a number of adaptations. Penetrating the arrid earth with their sharp, elongated beaks, they can siphon moisture from the ground as well as feed on small subterranean organisms, ensuring optimal health despite the harsh conditions of their environment. Perhaps the adaptation most crucial to their survival is their armored plates, which shield them both from the scorching desert sun and from predators. The face-like plate around the base of the Tokabi’s neck aids in its defensive stance, creating the illusion of a different body plan when the creature’s head is lowered to the ground. This diverts a predator's attention away from the Tokabi’s fragile eyes and neck in the event of an attack.

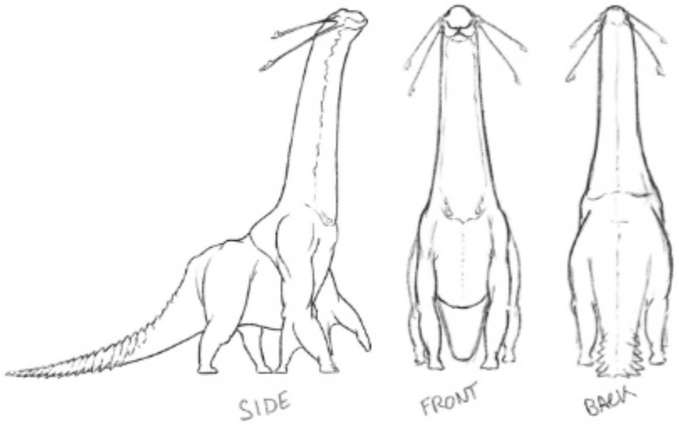
KANKRU

By Antonio Polidano Vella

The common paddle-rake is named after how it swims and eats. Their general shape resembles that of sea turtles and so does their sluggish speed. Paddle-rakes fulfill the niche of a small herbivore, though, small is a relative term for species on this alien world.

Individuals typically reside in the shallow areas and eat by dragging their tail skewers across the floor, dredging up edible plankton from the loose, organic debris. Sometimes they are observed consuming their own waste—whether this is a tactic to extract more energy (similar to rabbits) or is meant to hide a scent trail is still unclear to researchers.





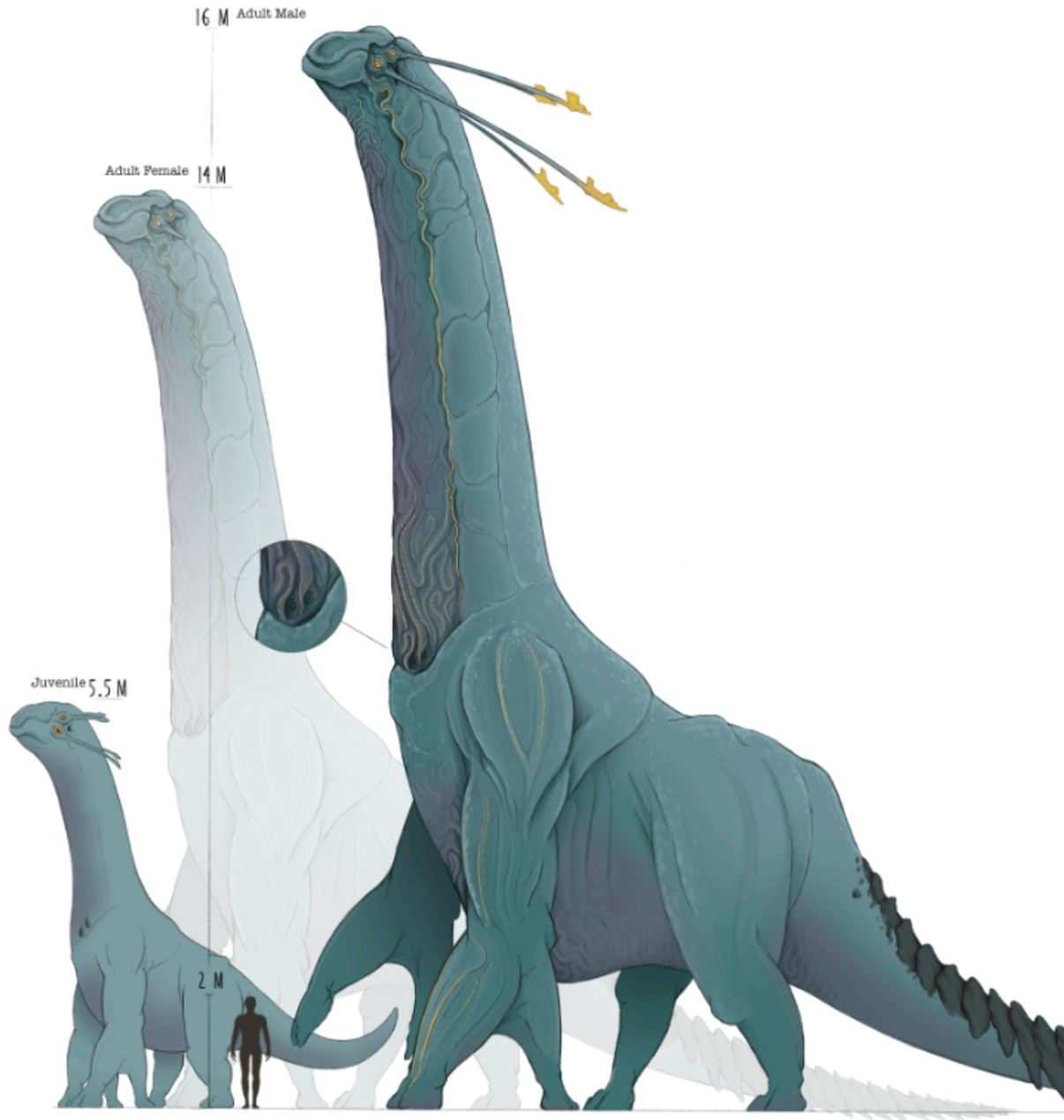
TURRIM BESTIA

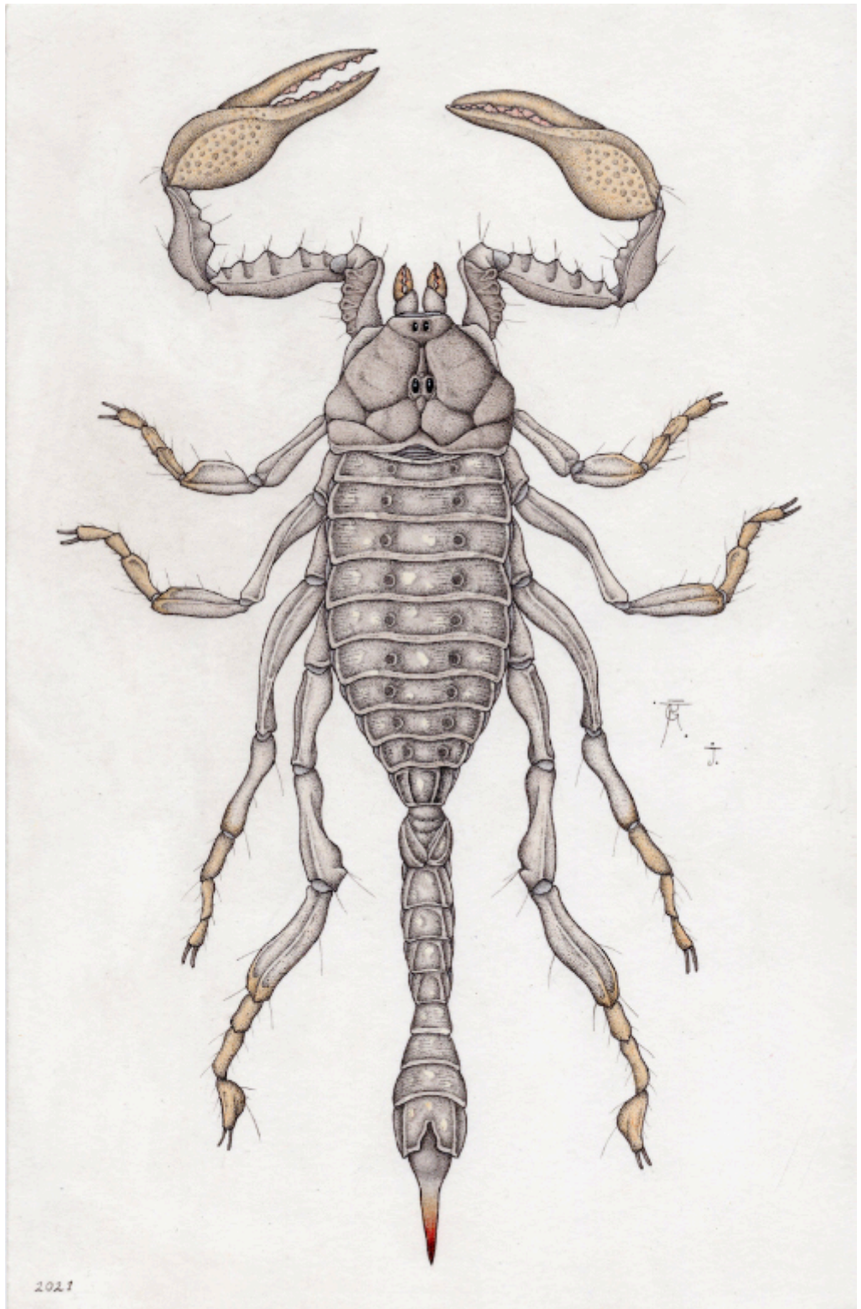
By Alexander J. Carbo

A nearly untouchable titan, this creature dominates the Mycelial Forest. Averaging at 16 meters tall, and nearly 32 metric tons, the Turrim are the definition of "gentle giants." However, do not mistake their docile nature to mean they are harmless. Turrim are capable of dangerous acts of self defense.

Their large, bony plated tail has impressive flexibility, allowing them to use it as a spiked club with terrifying force. If a Turrim feels threatened, not only do they assume a defensive position and display their menacing tail, but their array of colorful bioluminescence shifts to an alarming violet. This contrasts the normally warmer yellow color they show when going about their day to day lives. Or, when they are performing one of their extravagant mating rituals, the color shifts to a lime green. The complexities of bioluminescence have developed for a vast majority of animals in this world, especially in the Mycelial Forest. In the lower layer of this biome, sunlight is scarce, and in some cases nonexistent. Theoretically, the evolution of eyesight should be stunted, but not here. Quite the opposite. The Turrim and many other animals have developed complex eyesight and the ability to produce colorful lights streamlined underneath their translucent skin. The displays of this bioluminescence are mesmerizing, underneath the canopy becomes an array of chromatic excellence.

Like many creatures native to the Mycelial Forest, the Turrim have developed a complex respiratory system. The nostrils filter out deadly spores that are potent in the air, making the Turrim immune to infection from the fungi.





DAGGER-TAILED SCORPION (BUTHUS PUGIOCAUDATUS)VANAHEIMENSIS)

By Reinhard Gutzat

The dagger-tailed scorpion epitomizes an uncanny familiarity found across much of the wildlife discovered on Vanaheim. To the trained or observant eye its differences from any known species of scorpion on Earth are readily apparent. And yet it is immediately recognizable as a scorpion, its similarities to those of Sol III undeniable. This seems to suggest a clear genetic and evolutionary link, however unlikely that might be. Several other plants and animals found on Vanaheim also appear related to biota thought native to other worlds. The implications of such connections are far-reaching and profound, hinting at the possibility that Aurvandil IV is a kind of biological preserve or habitat world. This of course raises many questions, the two most relevant being: Who seeded the planet with biological specimens from across dimensions? What fauna and flora are native to Vanaheim, if any?

WOLFHEN & DIRE BONEBILLS

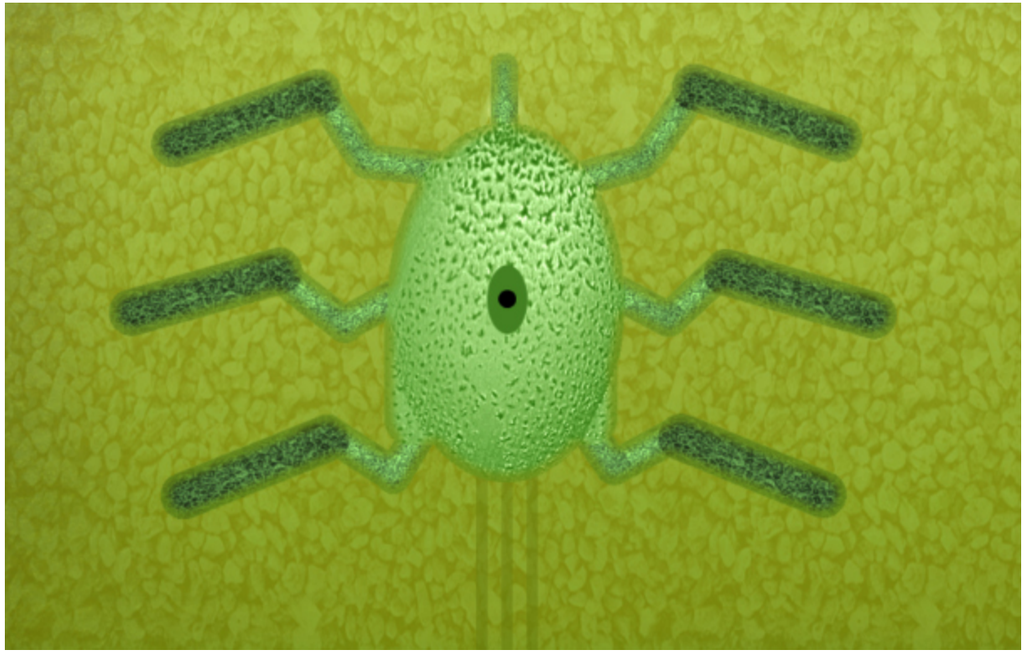
By Thien Anh Nguyen

In the far northern grasslands, a small party of White-napped Wolfhens and Dire Bonebills corner a Hirsutorn mother and her chick after having separated them from their flock. Bonebills are often welcomed into wolfhen packs, where their ability to track prey and corral them in the direction of their partners grant them tremendous success in hunts. Together, the pack can take down prey many times their size.

CACTALAND COCKATOO (OPUNTIAPSITTACUS AGRICOLA)

By Alejandro Martínez Fluxá

During the Artechocene period, a species would develop civilization and technology not seen in almost 40 million years. This is the cactaland cockatoo, one of the many species they manage to completely domesticate the Elewary (Echinopodornis macroceras domestica), a large ratite species from the dry grasslands and shrublands of Australia. The cockatoos have been selectively breeding these feathered giants for transporting large amounts of cargo and also as protection against predators. For thousands of years, these psittacids have been selecting the most docile and manageable ones, while taking out the rest using the method shown in this picture. A quick and easy way to clean the domestic elewary gene pool, which also provided the cockatoos with food for days.



PADDLE RAKE

By Auto-Icon

The common paddle-rake is named after how it swims and eats. Their general shape resembles that of sea turtles and so does their sluggish speed. Paddle-rakes fulfill the niche of a small herbivore, though, small is a relative term for species on this alien world.

Individuals typically reside in the shallow areas and eat by dragging their tail skewers across the floor, dredging up edible plankton from the loose, organic debris. Sometimes they are observed consuming their own waste—whether this is a tactic to extract more energy (similar to rabbits) or is meant to hide a scent trail is still unclear to researchers.

QUADRIBRACHION

By Slartopod

Quadribrachion is a carnivorous species that lives in the plains of the southern continent on the planet Faran. They catch prey with their forearms before injecting venom, which this particular species does at night. Quadribrachion are a species that is categorized in the group Venebrachionidea—a group who possess venom glands in their first pair of arms. The Venebrachionidea are further included in the clade Multipoda—made up of eight limbs, two eyes, four ears, and two breathing holes on their head. On the planet Faran, the two largest continents are wildly different due to their distance from each other, resulting in life evolving divergently on these two landmasses. For example, in the southern continent there are green plants, the Prasinophyta, and in the northern continent there are red plants, the Erythrophyta, and both continents possess animals arising from two distinctly different body plans.

CONTRIBUTORS:

CHIEF EDITOR

Domenic Pennetta

GUEST ARTIST

Curious Archive

NEW ARTISTS

Alexander Carbo

Antonio Polidano Vella

Auto-Icon

Carlos Albuquerque

Diego Ortega Anatol

Dylan Bajda

Hodari Nundu

Palerelics

Doink Yoink

Hunter Welch

Maryana Simpson

Michal Janovský

N. D. Cebula

P. Adams

Slartopod

REOCCURRING ARTISTS

Alejandro Martínez Fluxá

Christian Cline

J. J. Aniorte

John Meszaros

Lorenzo Battilani

Michal Sadowski (Ycyprid)

Reinhard Gutzat

Savely Kochnov

Thien Anh Nguyen

Veknor