# ASTROVITAE

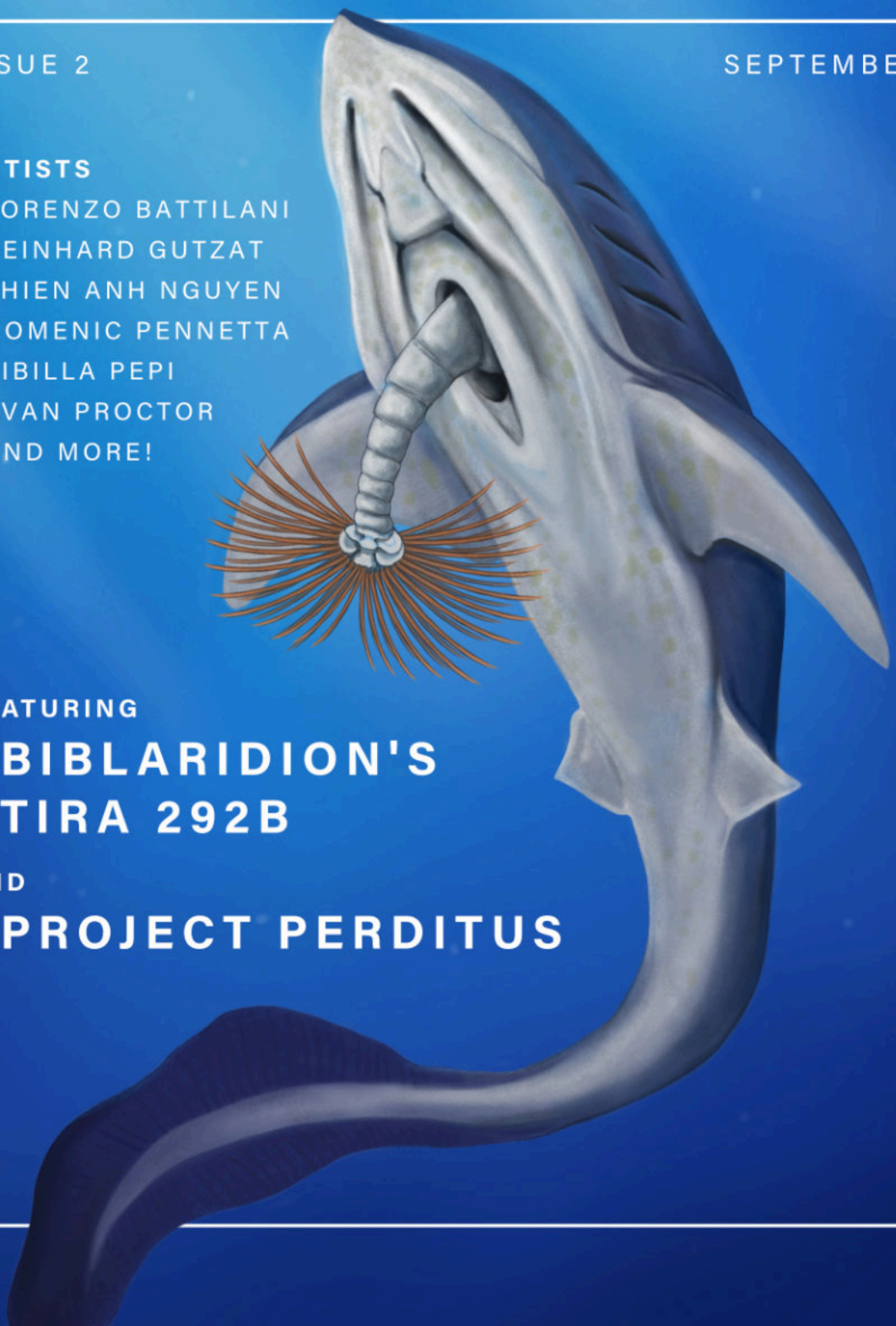
"A GLIMPSE OF LIFE ON OTHER WORLDS"

ISSUE 2

SEPTEMBER 2021

**ARTISTS**

LORENZO BATTILANI
REINHARD GUTZAT
THIEN ANH NGUYEN
DOMENIC PENNETTA
SIBILLA PEPI
EVAN PROCTOR
AND MORE!



**FEATURING**

## BIBLARIDION'S TIRA 292B

**AND**

## PROJECT PERDITUS

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By Domenic Pennetta

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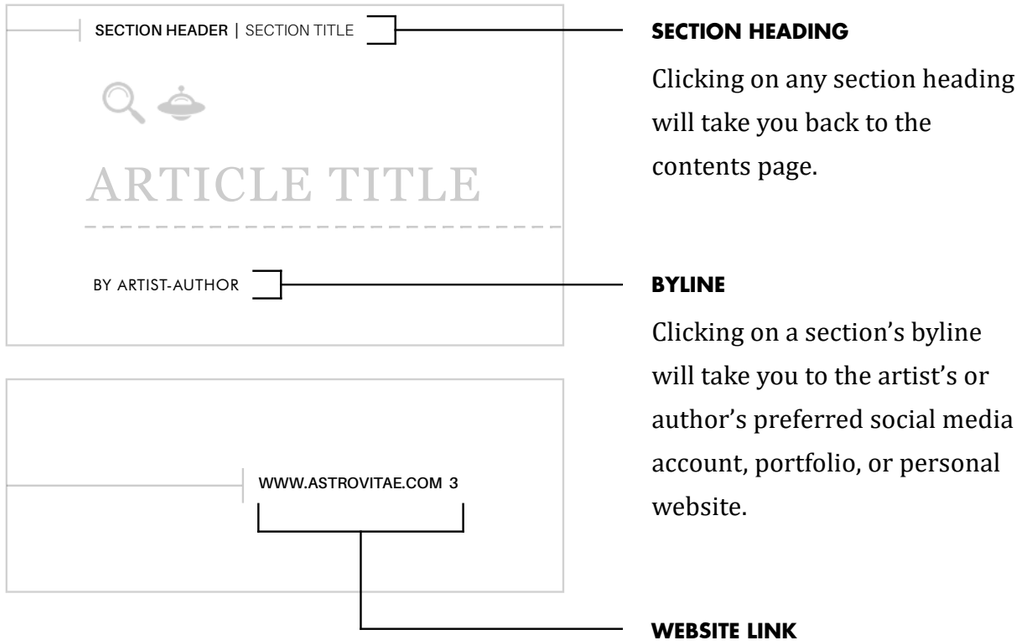
## HOW TO USE THIS DOCUMENT:




**SECTION HEADING**
Clicking on any section heading will take you back to the contents page.

**BYLINE**
Clicking on a section's byline will take you to the artist's or author's preferred social media account, portfolio, or personal website.

**WEBSITE LINK**
On the bottom right page there will be a link to the official Astrovitae website.


Organizing a new issue for Astrovitae takes a lot of work — that's why I opened up an official Ko-fi page! There are many tasks involved during development, such as corresponding with contributors, reaching out to artists, editing text submissions and images, other design work, 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 magazine! If creating issues becomes profitable in the future, then my plan is to commission contributors for their art and submissions. That would be the greatest thing for the community!

**VISIT ASTROVITAE'S KO-FI**

Dear Reader,

I am happy to announce that the first issue of Astrovitae was a huge success! I have been pleased with the amount of attention that issue one received, as it was shared around the internet across many social network platforms and forums. There are plans to promote the magazine more heavily on the internet coming forward, but the most efficient means of promotion relies on all of you to share Astrovitae with friends and family! Thank you all so much for advocating for the magazine and contributing to the speculative community!

On another note, several close peers have asked if I would personally include more of my own work in subsequent issues. Of course, I'd love to! However, Astrovitae began specifically as a way to show off the work of interesting artists and authors in the community. I seem to forget that this also includes me, as I sometimes find myself more fascinated with other creators and their projects more than my own! This time there is a brief feature about my own speculative project, called Project Perditus, which has existed for more than a year now.

I hope that you enjoy this second issue! It again features a diverse set of creators and speculative projects, each including details about their world and creative processes. I want to thank all my contributors, especially our guests Biblaridion, creator of the *Alien Biospheres* Youtube series, and Jay Eaton and Hye Mardikian, creators of the speculative biology zine *Almost Real*, for participating n this issue of Astrovitae!

Sincerely,
Domenic Vincent Pennetta

# 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

**HARD SPEC**
Heavy research or use of data in worldbuilding

**EARTH SPEC**
Involves Earth or organisms from present day

**PALEO SPEC**
Involves organisms from Earth's past history

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

**ALIEN SPEC**
Xenobiological anatomy, biology, and evolution

**PLANET SPEC**
Focus on planets and their unique features or physics

**UNIVERSE SPEC**
Unnatural or otherworldly physics and matter

**MYTH SPEC**
Related to cryptids, fantasy, and mythology

**ENVIRO SPEC**
Emphasis on environment, landscapes, or scenery

# SPEC NEWS:

Issue 2 of Astrovitae now features Spec News, a section dedicated to sharing videos, interviews, book releases, memes, and community events! (Curated by Domenic Pennetta)

INTERVIEW

## INTERVIEW WITH ALEX RIES!

*June 6*

The Youtuber *1 Up Nerdcore* hosted an interview on his channel with Alex Ries, the concept artist behind the creatures in the videogame *Subnautica*. In the video Alex explains how he first reached out to Unknown Worlds Entertainment, what kinds of research he does to create interesting aliens, and he even comments on the difficulties and mental illness concept artists face in the entertainment industry.

*https://youtu.be/BTb-CR5K264*

YOUTUBE VIDEO

## ALL TOMORROWS: THE FUTURE OF HUMANITY?

*June 10*

Youtuber *Alt Shift X* created an abridged retelling of *All Tomorrows*, a book written and illustrated by C.M. Kosemen. All Tommorrows has received a striking amount of popularity these past few months, which may have been bolstered by Alt Shifts video, where he cinematically explains each post human species who were radically altered by an intelligent race called the Qu.

*https://youtu.be/imNtSPM3-r4*

VIDEOGAMES

## AVATAR: FRONTIERS OF PANDORA OFFICIAL REVEAL TRAILER!

*June 12*

E3 this year offered us an amazing reveal of Ubisoft's new game *Avatar: Frontiers of Pandora*. Based on James Cameron's Avatar, the reveal trailer revisits the lush world of Pandora, which we all have been eager to see return! Not much of the game is explained, as the trailer only acts as a technical showcase of Ubisoft's new Snowdrop Game Engine, which can procedurally generate Pandora's expansive flora, fauna, and environments quickly and with ease.  Let's just hope Ubisoft doesn't deface the iconic brand with lackluster gameplay...

*https://youtu.be/Axmg1E4HrVE*

YOUTUBE VIDEO

## THE NEW DINOSAURS EXPLAINED

*June 16*

A new Youtube channel under the username *Curious Archives* showcases anything unusual and interesting. Videos cover speculative zoology, history, mythology, paleontology, archaeology, literature and much more! Since the channel's official debut in June of this year, many videos have been released showcasing speculative works, such as Dougal Dixon's *After Man*, Dylan Bajda's *Serina*, and Sam Vilasboas's *Anu* among others projects.

*https://www.youtube.com/watch?v=rWw3bF-OAxg&ab_channel=CuriousArchive*

KICKSTARTER

## ALMOST REAL VOLUME 4 BACKED ON KICKSTARTER

*June 30*

Jay Eaton's and Mia Hye Mardikian's zine *Almost Real* officially had their 4th volume backed on kickstarter. If you are unfamiliar with the publication, Almost Real is an anthology series consisting of different speculative biology prose and artwork entries. Each volume is focused on a particular theme, the 4th volume of which takes a look at biotechnologies, specifically at cybernetic enhancements, genetically modified organisms, and their futuristic implications. If this interests you, Jay and Hye were gracious enough to lend me a sneak peak of their 4th volume! (See Pg. 12)

*https://www.fortunamedia.co/almost-real*

YOUTUBE VIDEO

## ALIEN HORIZON: EPISODE 1

*Aug 14*

*Alien Horizon* is an ridiculous fever dream. This speculative project describes the rise of liferforms called stingraliens on the pitiful planet called Dolos while narration is provided by an irritated and omnipotent robotic voice. The narrator describes the project as he and the content of the project becomes more chaotic and nonsensical. It is a clear parody of the recent Youtube speculative projects that have recently risen in popularity, providing commentary on the incestuous nature of new video-based speculative evolution projects.

*https://youtu.be/fl2b05-tj_U*

# OTHER NEWS:

YOUTUBE VIDEO

## FIRE BREATHING PARASAUROLOPHUS THEORY

*June 4*

Vintage dinosaurs are always an interesting sight to behold. Often their depictions are outdated, depicting morphology or behavior we now understand to be untrue. However some of these depictions are downright ludicrous, especially if they depict a dinosaur breathing fire like a dragon! Youtuber *Dino Diego* released a video that explores the history of a cursed image illustrating a fire-breathing parasaurolophus, a history rich with creationism and paleontological speculation.

*https://youtu.be/Difw1fNxgsE*

GRAPHIC NOVEL

## GODLINGS: AN ONLINE GRAPHIC NOVEL

*July 7*

*Godlings* is a one-woman passion project by the illustrator Meg Gullotto. The large ongoing graphic novel follows a collection of gods from various religions and mythologies, all of which race to uncover a way to restore their dwindling immortality. I was originally drawn to the story by the design of Quetzalcoatl's serpent form, but the amazing character designs and beautifully illustrated panels kept me intrigued. Meg is also an award winning medical illustrator, whose works are highly detailed and elaborate. Anyone interested in speculative biology will certainly appreciate her detailed works of both anatomy and fantasy!

*https://www.theartfulmegalodon.com/godlings*

# ALMOST REAL:

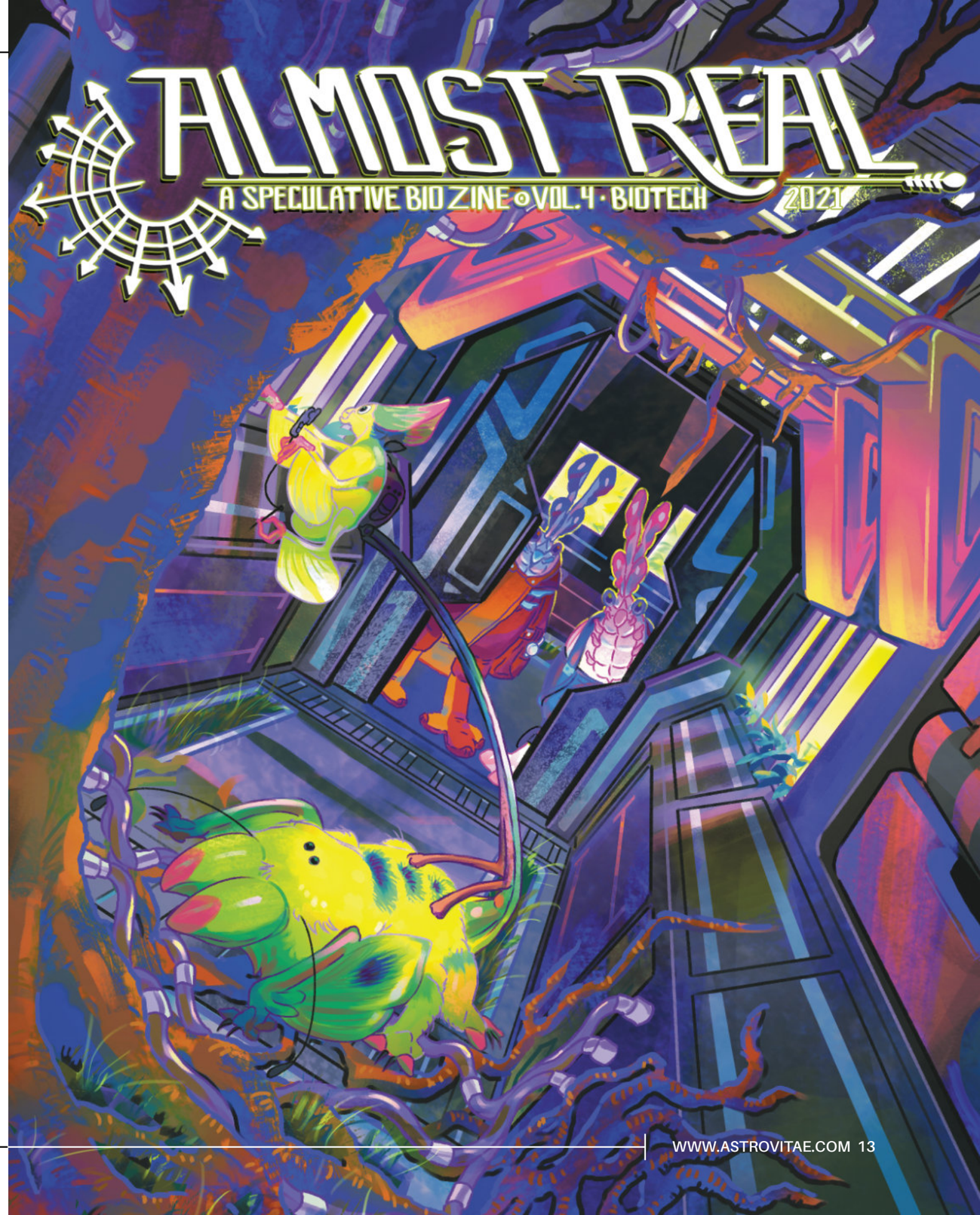
*Almost Real* is a softcover, full-color zine series that features 12 entries per-themed issue, ranging from ethereal life in the clouds to the biomechanically engineered! Created by Jay Eaton and co-edited by Hye Mardikian, *Almost Real: A Speculative Biology Zine* aims to capture fantastical lifeforms and ground them in science-plausible ideas, with each of its four collections seeming so lifelike they could be "almost real".

*To celebrate the release of Almost Real's fourth volume, I reached out to the creators Jay and Hye! I had inquired about the origin behind their zine and also about what inspired both of them as artists. I want to personally thank both creators for letting me share art featured in the most recent volume, and I hope my audience enjoys a brief glimpse into the zine! - Domenic Pennetta*

**"How did the idea for a speculative biology zine first come about?**

**Jay:** I had seen other people doing collaborative themed zines for subjects they were interested in, like fandom charity zines or the objecthead zine. I was interested in doing some kind of minor online-published one-off project for a subject I was very interested in, speculative biology, and I brought it up with my friend Hye because they had more experience running anothology projects with me. Hye was immediately down to not only help, but run an actual kickstarter and printed edition for it. Without that push Almost Real would not have been what it is today.

**Hye:** Like Jay said: they were the one who approached me! Almost Real is definitely Jay's original brainchild, and I'm just honored to be along for the ride on the printing, interior design, and administration side of things. When we first started laying



**Hye (continued):** the groundwork for Volume 1 back in the summer of 2017, I had just moved to Seattle and wrapped up Kickstarter fulfillment of Fortuna Media's first comic anthology, and the idea of doing a printed collaborative effort that was on the smaller side but still annual was more than enticing.

## “ What previous speculative biology media inspired Almost Real?

**Jay:** Honestly, mostly people's web projects. I spent a lot of time on the internet as a kid, reading sites like Life on the *Planet Furaha, Snaiad*, DeviantArt specbio artists, *Serenia,* and etc. There's something magical about uncovering these massive, labor of love worldbuilding projects that people have been posting on the net for an audience of dozens for over a decade. I wanted to get a chance to spotlight the creations of some those artists, and bring more eyes to their amazing work!

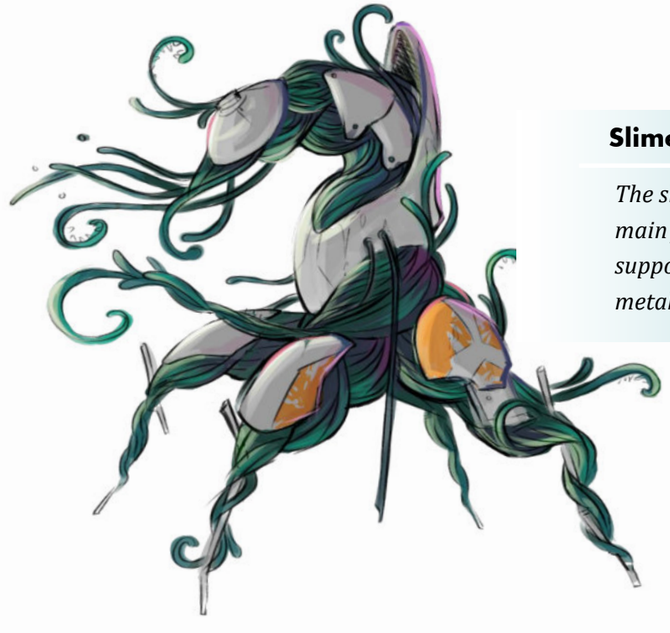
**Hye:** Since I manage things from a more design and layout point, I pulled from a lot of printed infographics, encyclopedias, and scanned museum pamphlets that I could find online for inspiration. As a child, I devoured *Zoobooks* whenever they came in the mail, and my grandparents gifted my folks a beautiful *Compton's Encyclopedia* set that I got lost in for hours; to this day I can remember being enraptured with how things were laid out, and how people could align information and illustrations together. Jump forward to today: when we first started planning out the zine, I quickly realized that there were hardly any printed collections of the kind of collaborative spec bio project we were planning. The beginning was very much a venture into the unknown, trying to figure out how to both highlight the contributors and their creations in equal weight. While each issue has had its own unique design challenges, they've been fun puzzles to put together, and as a designer it's extremely rewarding to see each issue shine hand in hand with its theme.out how to both highlight the contributors and their creations in equal weight. While each issue has had its own unique design challenges,

**Hye (continued):** they've been fun puzzles to put together, and as a designer it's extremely rewarding to see each issue shine hand in hand with its theme.

## “ What future goals are in store for the zine?

**Jay:** Well, there's gonna be more of them. There's a lot more artists we have eyes on, and plenty more biology topics to cover. I'm excited to share them with everyone!

**Hye:** The more the merrier, and this is just our fourth volume! Our next issue's theme is looking a little fantastical, if you catch our drift, and since this will be the fifth installment we have some special hallmarks for this collected edition. Right now it's just a big enough project that we can both handle, and we're eternally grateful to our readers and supporters for the cool little corner of spec bio we've managed to carve out for ourselves.



**Slime Mold-Machine Hybrid**

*The slime mold’s limbs carry the main fungal mass, with extra support from integrated scrap metals which are worn like armor.*

*(Image by Galen "Strop" Haecky)*

**Within the Epsilon Tauri system orbits the earth sized moon of AMATERU I.** Its host planet, the immense gas giant Amateru prime, fills much of its horizon. The immense gravitational pull has left a graveyard of asteroids, comets, and most strikingly, space junk in its wake. The epsilon tauri system is a veritable junkyard of castoff satellites and spacecraft, and the rings of Amateru prime are rich in refuse. For the poor moon, this means that meteor showers of space junk are a common phenomena– the surface being pockmarked by scorched hulks and rusted rigging. Despite this life flourishes on the moon, taking on strange adaptations to process the array of raining machinery.

The **KERAUNOPLAST** is a slime mold-like organism that trawls the metal rich soils for sustenance. Like much of the life on Amateru I, the Keraunoplast consumes electricity directly, without the need to first convert it into chemical energy. In its juvenile stage, it exists as a collection of free associating single celled organisms that spread across the surface. In this state, it steals electrons from the various metals it contacts to feed itself. However, when a collection of keraunoplasts encounter machinery they will undergo a dramatic transformation. Once contact has been made, the Keraunoplasts begin dividing rapidly, creeping up the construct like vines. The single cells begin joining together to form a colonial organism, with groups of cells specializing into tissues and organs around the device.

**AMATERU I**
*Epsilon Tauri gas giant*

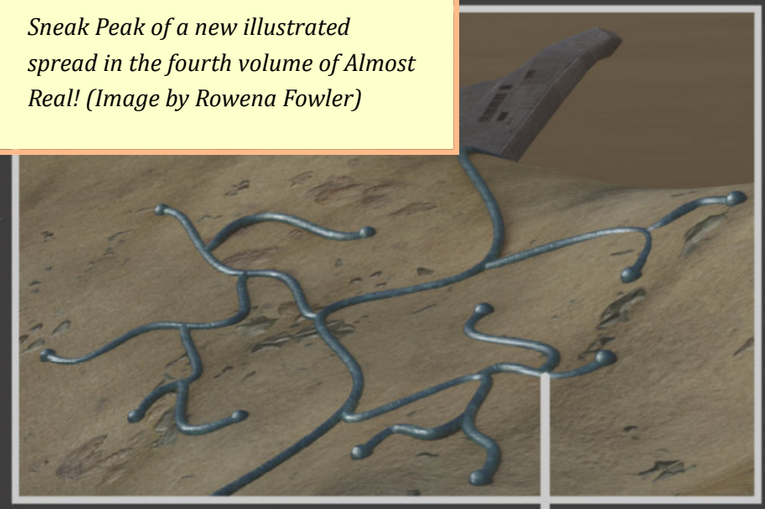
*Keraunoplasts will only undergo this transformation if they can determine that the device they'd repair can generate enough power to sustain themselves.*

**KERAUNOPLASTS**
*colonial electric organism*

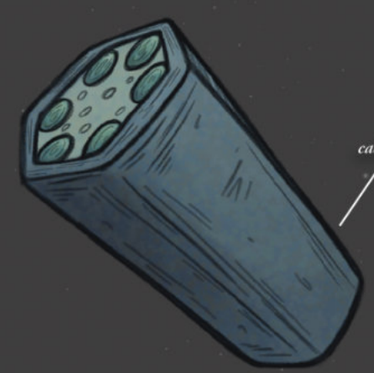
*Some cells link together to become circuits, others into transistors, and others more merge into batteries. The keraunoplasts graft themselves into machinery, replacing damaged inorganic components with living, organic equivalents.*



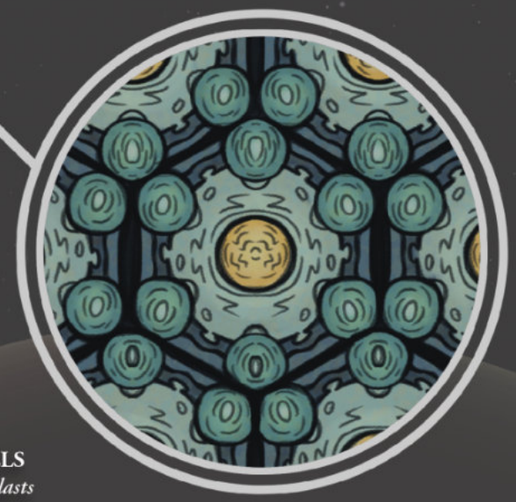
*Sneak Peak of a new illustrated spread in the fourth volume of Almost Real! (Image by Rowena Fowler)*



In their juvenile stage, Keraunoplasts link together into a singular mass. As they travel together, any free floating cells they encounter will also join the mass in the search for viable machinery. These clusters can span out over an area as large as an entire square kilometer. Keraunoplasts have a rubber like cell membrane that acts as as an electrical insulator. At its corners are electron harvesting organelles which are used to cultivate the electricity it needs. They are arrayed with fine conductive hairs that catch electrons and allow clustered Keraunoplasts to exchange electrons with one another.



*cable cell*

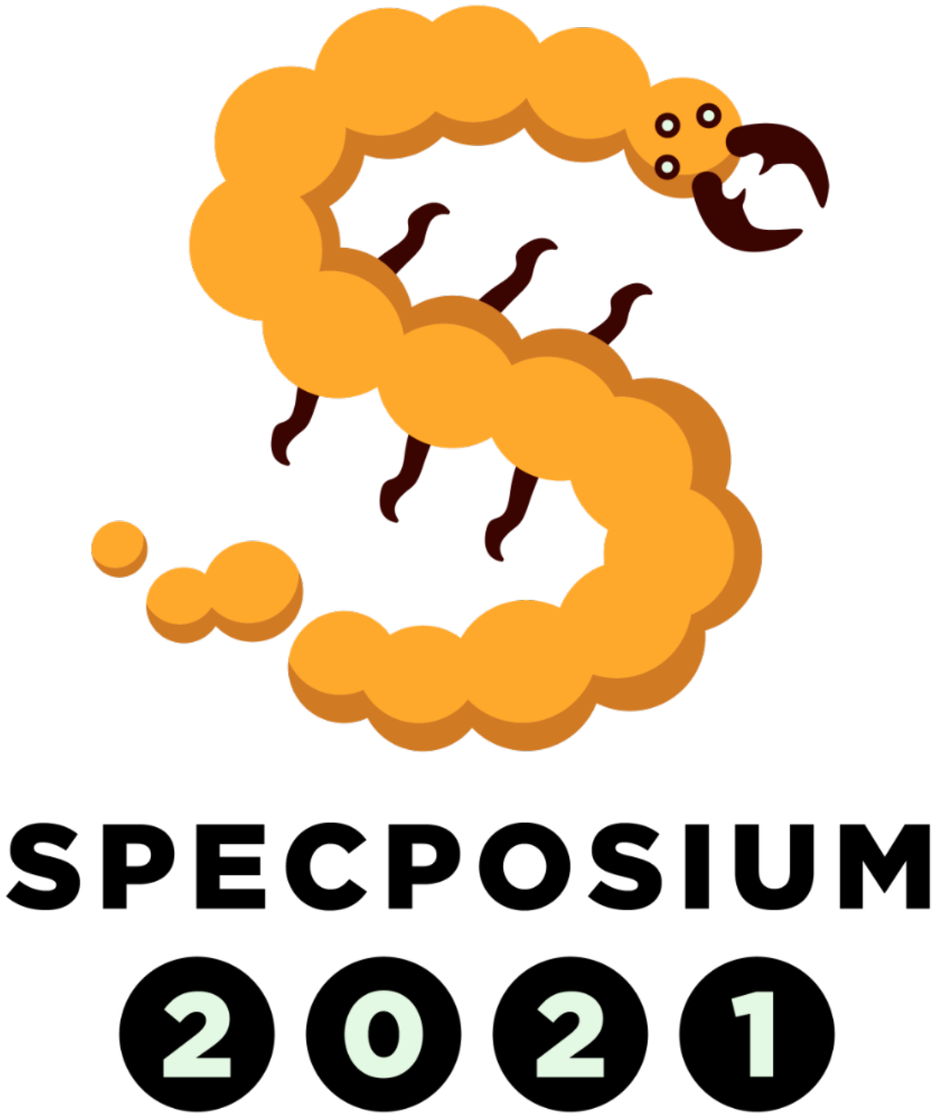


*cable cell (interior)*

**SPECIALIZED CELLS**
*colony-stage Keraunoplasts*

*transistor cell*

Keraunoplasts that take on the role of "wires" will retract their electron harvesters completely within their body and convert them into center conductors. The cell will elongate and seek out nearby cable cells to form into long wire chains to ferry electricity throughout the device. The Transistor cells will flatten out and merge their electron harvesters into three prongs: an emitter, a base, and a collector. The cell membrane hardens and the Keraunoplast will push the prongs out of its body along one side.




***Specposium Logo.*** *A redesign of the official logo by Domenic Pennetta for Astrovitae.*

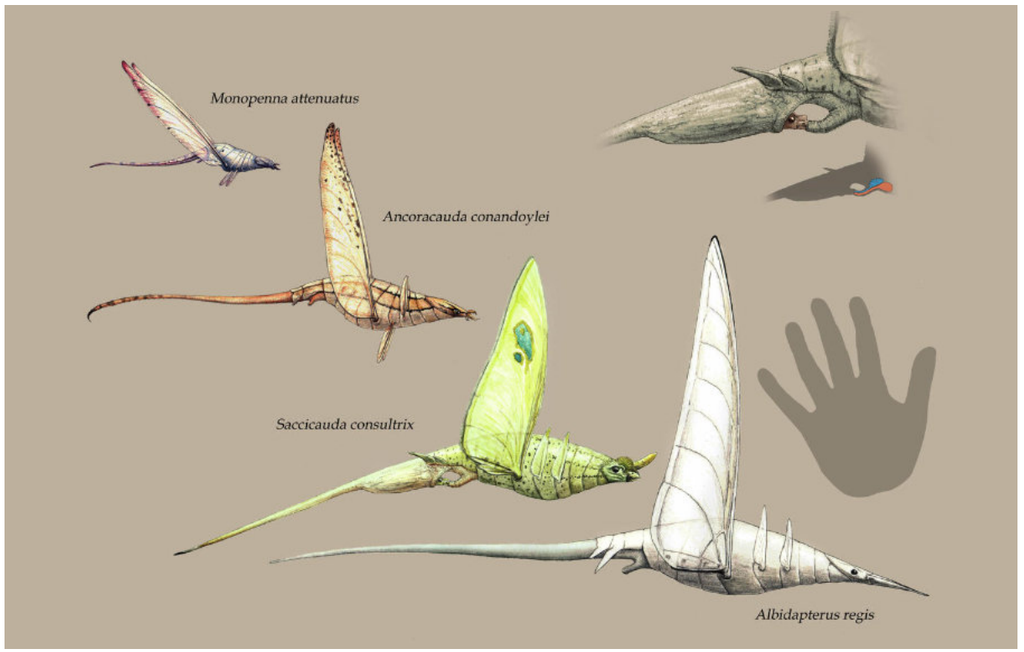
# SPECPOSIUM:

*I had the opportunity to be a part of the first ever Specposium event held by Charlotte Bowman, creator of the Dracones Mundi project, and Henry Thomas, creator of On Beyond the Holocene. Together Charlotte and Henry hosted a speculative evolution symposium where those interested in the genre could give presentations about speculative media or their own speculative biology projects. Like Astrovitae, Specposium was conceived during the COVID-19 pandemic and looked to bring the community together during difficult times. I asked Henry to briefly describe the origin of Specposium and give some details about it's content. I hope that many more will join the next conference coming in 2022! - Domenic Pennetta*

BY CHARLOTTE BOWMAN & HENRY THOMAS

In reaction to the global COVID-19 pandemic of 2020, many countries underwent lockdowns to prevent the spread of the virus. This meant that academic conferences and symposiums had to evolve from in-person gatherings (which would be considered 'super-spreader' events during the pandemic) to online meetings. Some of these online meetings were lackluster imitations of the conference atmosphere, with unusual choices in software which constantly broke, making it difficult to attend talks and to ask follow-up questions, while other conferences used more user-friendly technologies.

We both realized that some of the more enjoyable scientific conferences seemed fairly easy to set up. What was needed was a chatroom, a way to show live video and audio, and a time that suited people across various time zones. Henry is a master at making websites, and within a few days of Charlotte saying "pah, conferences look easy, I bet we could host one" we had already started preparations. The goal of Specpsium was accessibility: an easy-to-use platform,




***Saccicauda and Albidapterus.*** *Creatures designed by the artist Joschua Knüppe (Hyrotrioskjan) who gave an impromptu presentation about his aliens belonging to the planet Silvanus.*

no joining fees, and no academic experience required (which is one of the reasons we went for a pseudo-science, science fiction, creative writing-based subject – the other major reason is that it is awesome! We also had a timesheet for presenters to fill out. This made presentations run at a convenient time for attendees in their own time zones, allowing the first Specposium to be a truly global experience.

Neither of us are particularly big names online, so we were surprised when links to the official Specposium website managed to spread fairly quickly on Tumblr and Twitter, and even on Reddit and other forum threads. We made the conference public only a month or so before the final agreed date of the conference, so given the small audience and short time frame, we were both very pleased with the large and enthusiastic turnout for the conference. The talks ranged from animations about a world where dinosaurs never died out, an exploration of future animals, the wildlife found on undisturbed islands, the possible biology of mythical animals, a look at the phenomenon of pixel 'evo games', and some reviews of beloved speculative evolution media. We feel that the Specposium was a resounding success, and that it helped, at least a little bit, to bring the speculative evolution community together!

SPECPOSIUM
2021

**SPECPOSIUM WILL RETURN IN 2022!**

**JOIN SECPOSIUM'S DISCORD!**

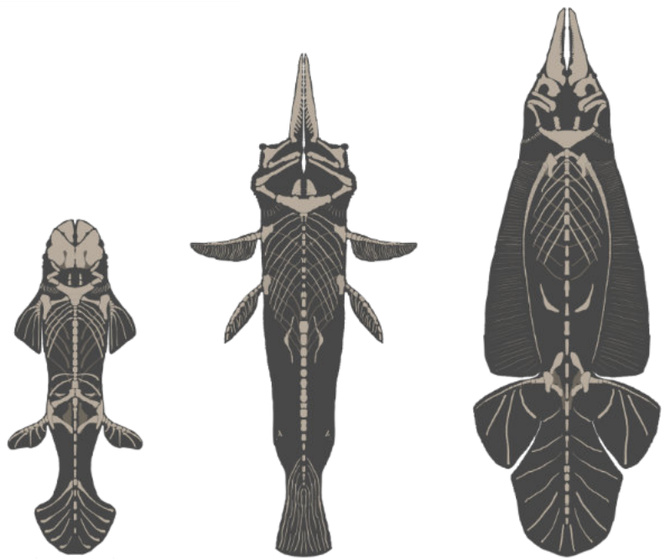
**VISIT SPECPOSIUM'S WEBSITE!**

# JOIN PROJECT SIL

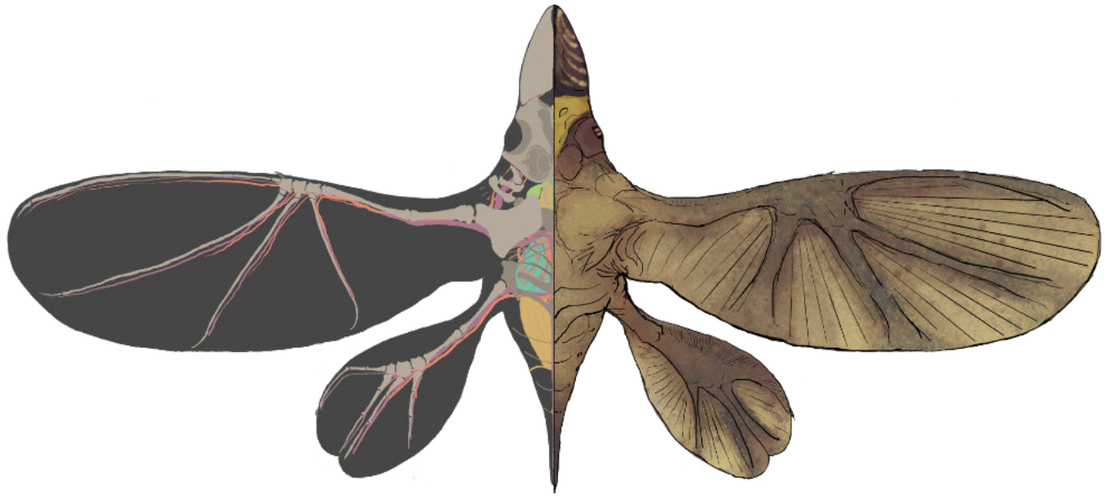
Sil is a collaborative speculative evolution project beginning on the 24th of September, 2021. The project is focused on a single island for a period of about 30 million years. Limiting out scope will let us focus on creating one complex, dense, and realistic ecosystem.

To follow the project or become a member, see the link below!

**JOIN SIL'S DISCORD!**



***Body Plans.*** *Three basil body plans that will be referenced while creating additional creatures during the project.*



***Pebblethroat.*** *Pebblethroats are small, flying omnivores, feeding mostly on nuts and smaller organisms. They climb along the surfaces of trees in a similar fashion to squirrels, using the small claws and gripping pads in their limbs. The skin of Pebblethroats isn't actually a part of the creature. Rather is a symbiotic mold-like organism known simply as "cover". Cover is very vulnerable to toxin produced by a sea-living microbe as a byproduct of its photosynthetic process. Contact with seawater is almost always fatal to Pebblethroats, as they lose their cover as a result.*

Lahaar is a small, rocky planet not that dissimilar to earth. It is around 3.4 billion years old at the start of our first project. One notable detail is the slightly higher gravity. The surface is rich in life; both the sea and land have been conquered by the planets organisms. There had been two major mass extinctions in the planets recent history. The first that happened around 140 MYA, when the plants oxygen levels plummeted. This killed off almost all land fauna, as well as around 80% of species in the sea. After 35 million years the planet would see its second mass extinction event. A new group of photosynthesizing microbes would take over the planets waters, and flood the sky with chemicals that rapidly depleted the planets ozone layers, and continue to do so to this day.

# A BRIEF REVIEW OF THE TEEMING UNIVERSE

CHRISTIAN CLINE, REVIEW WRITTEN DOMENIC PENNETTA

Last year I became acquainted with Christian Cline, a freelance illustrator with a keen interest in speculative evolution and science fiction. The soon-to-be graduate from the Savannah College of Art and Design (SCAD) and has been working on his book, *The Teeming of The Universe: An Extraterrestrial Field Guide*, throughout his academic career. I, like many of his followers on Instagram, would be amazed by his posts depicting paintings of fanciful environments, organisms, planets, and spacecraft. After some time these images on his Instagram grew and grew, forming a truly expansive worldbuilding project. Chrisitan's book was published this month on September 5th, and I know no better way to celebrate his achievement but by leaving a brief review of his first ever art book!

The Teeming of The Universe: An Extraterrestrial Field Guide is a pseudo-scientific illustrated guide on aliens and the planets they reside on. There is no discernible narrative or characters, instead the book relies on a series of elaborate descriptions of 11 worlds awaiting to be explored. Each section is separated by beautifully illustrated spreads of space explorers traveling on or between planets, creating a tangible sense of progression as the reader is taken from one world to the next, finding more complex and bizarre lifeforms with each turn of the page! There is a lot of content in this book. Over 300 pages brimming with art, diagrams, and vivid descriptions of the creatures, environments, and planetary bodies. The book is surprisingly easy to follow as well, as many complicated scientific terms and concepts are broken down for the reader (there is even a glossary for supplementary reference). The book is definitely fun and engaging, and will certainly entertain your fantasy of investigating extraterrestrial life across the galaxy!



Although I do enjoy all of the worlds depicted in the book, my favorite one was Aiyte. The planet itself is a drier and dustier version of Earth, with a thinner atmosphere and colder temperatures. Plant-like organisms are black and dark brown due to the dim light coming from the planet's home star. To optimize photosynthesis, plants like the Sceta and Common western Kemernroot use bacteriorhodopsin, a special pigment more efficient at absorbing light. The faded sky and black foliage paints a gloomy environment with days that seem to be stuck in perpetual twilight. Inhabiting the dark grasslands of Aiyte is the infamous Helerene and humble Ochre Sandpig. Helerenes are stout creatures with fierce claws, a single eye which can see in infrared spectrums, and the ability to hunt in packs. While the Ochre Sandpig live a subterranean lifestyle, possessing poor eyesight and keen burrowing behaviors.

That being said, there is no work in existence without its criticism. And there are a few things that hinder the quality of the book, mainly the graphical format. For instance the font is a bit large on some pages, and there are several sections of the book that lack substantial page margins; which form eye-straining blocks of text. As a designer myself, these graphical errors stuck out to me and became somewhat meddlesome during my first read through. This is quite


***Sneak Peak.*** *An illustrated spread of Selise, the eighth chapter in the book. Every chapter contains an elaborate spread depicting the planet covered in the text. (Render by Domenic Pennetta)*

unfortunate as the artwork within the book is absolutely gorgeous! I just wish the book was more aware of negative space and graphic design fundamentals! But alas, all first attempts at self publishing end with some errors. Although the errors here are few and far enough for me to overlook them in favor of the art.

Overall, The Teeming Universe is a great experience! I really like this book and all its imaginative art, and I highly recommend it to anyone interested in science fiction, astronomy, creature design, and speculative evolution! I'm glad I am able to support a new artist, and I look forward to seeing more inspiring works from Christian in the future!

If interested, check out Christian's art at his Instagram account: https://www.instagram.com/christian_cline/?igshid=83d819ix4q8t

# CAPTIVATING WORLDS

# PROJECT PERDITUS

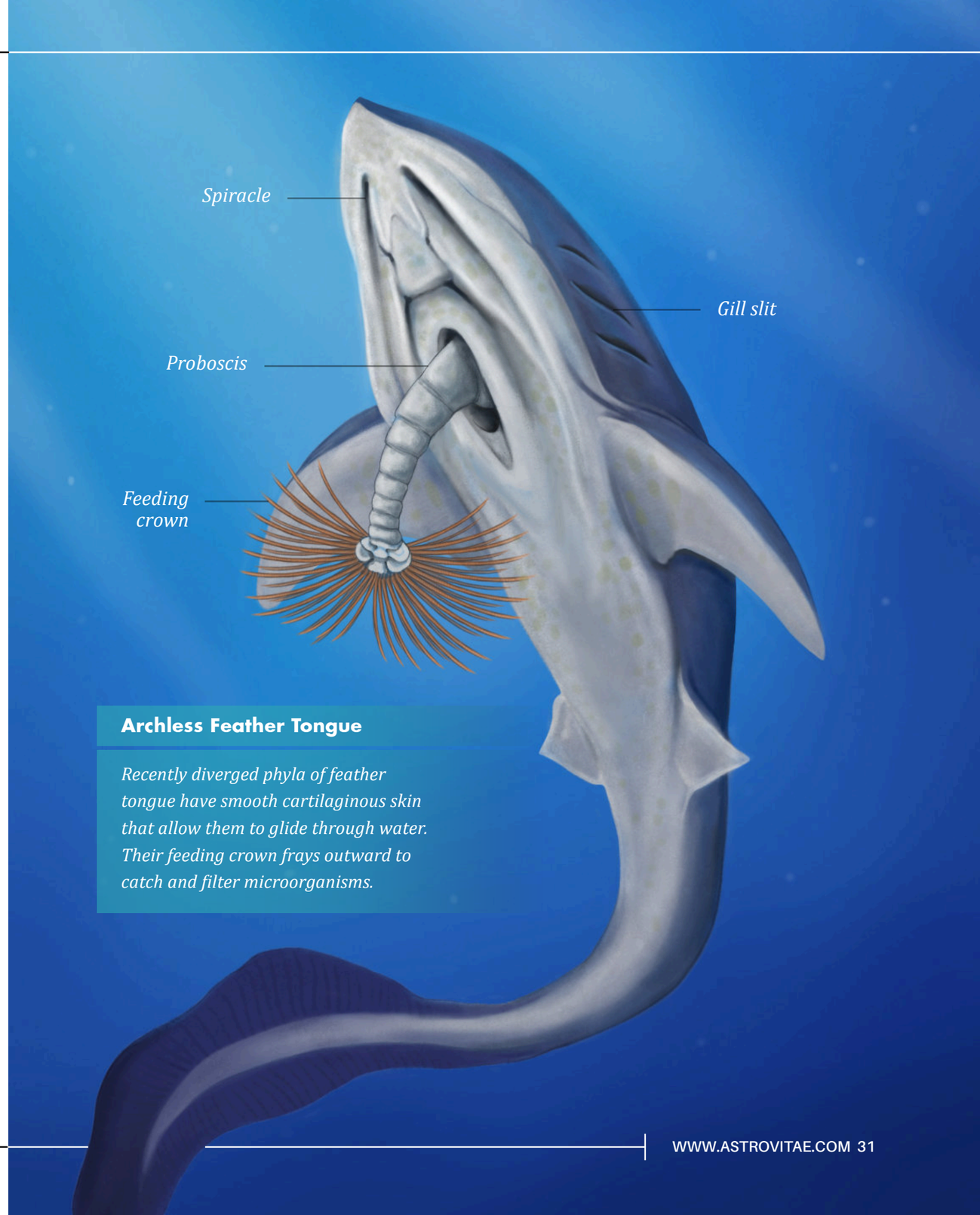
## Project Overview and a Brief Look at the Feather Tongues

BY DOMENIC PENNETTA

Project Perditus is a speculative biology project of mine that has been more than a year in the making. Perditus began as a photography project in school, but it then quickly morphed into a worldbuilding project more focused on illustration. The idea was to conceptualize alien creatures in sketches, create detailed clay models, take photographs, and then edit the photos to resemble scientific images. I eventually found, however, that illustrating creatures was more fun than just photographing them.

**The Setting.** In the distant future humanity has taken to the stars. After a long galactic war post-human societies fell into a dark age. Communities built large galactic shuttles designed to travel from star system to star system harnessing only light and radiation as fuel. Despite all the technical advancements, an outbreak of highly infectious parasites plagued one shuttle, effectively wiping out a fourth of the population before a cure was developed. Although it was not a complete catastrophe, the unprecedented massacre humbled the humans who were once again reminded of their mortality.

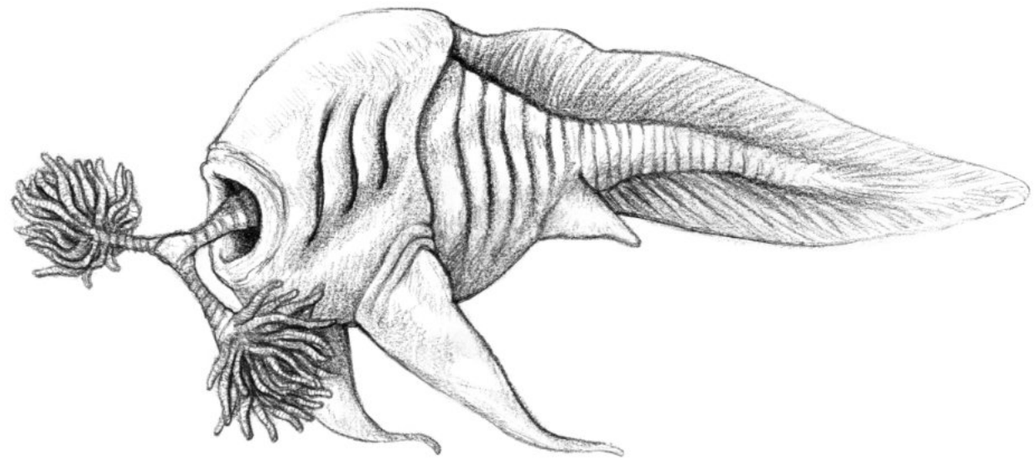
Post-humans looked to the past for comfort and began dreaming of recolonizing planets to live like their ancestors once did. To entertain this sentiment, a few post-humans decided to look to nearby star systems and find habitable exoplanets. They discovered



***Aquatic Scene.*** *A relative of the feather tongue, the "quill tongue" scours the shoals for a meal. Its proboscis is outfitted with a harpoon-like structure that can spear prey. Unfortunately, this quill tongue stumbled upon a smooth-back sea scuttle that is foul-tasting to most predators.*

Perdita A, a K-type sequence star (or orange dwarf star), and noticed a small terrestrial planet orbiting in its goldilocks zone. That planet was Perdita c, informally referred to as "Planet Perditus", which possessed strong sensory readings showing many biosignatures. A satellite was constructed named "Trawler-IV", which would make an eight year long trek to the Perdita c and observe life from its orbit. Outfitted with autonomous probes called "dredgers", wildlife could be observed up close and biota could be taken back to Trawler-IV for further study.

**Biota.** Under the scrutiny of Trawler-IV and it's autonomous probes, life found on Perdita c was slowly being uncovered. Observations showed that the planet's organisms were at an early stage of evolutionary development. Simple plant-like organisms began to thrive at coastlines, while most life occupied the expansive oceans. Benthic organisms known as sea scuttles populated the ocean floor. These specimens appeared to be a cross between earthly lobopodians (like prehistoric Hallucigenia) and holothurians (sea cucumbers), being mainly detritivorous and possessing many limbs. Sea stalks, a broad clade consisting of sessile animals with long protruding necks. They filter feed by passively siphoning micro-organisms from the water column. While the water column itself are inhabited by the flutter fleas, a clade of small planktonic specimens that hunt down other plankton. And these organisms are just a brief glimpse of life on Perdita c!



***Barbell Tongue.*** *Some feather tongues developed bizarre feeding proboscises, such as this type of arched feather tongue, which possess a feeding appendage that splits into two separate branches. Observe the slender gill slits that run down the length of its body; this trait is only seen in arched feather tongues.*

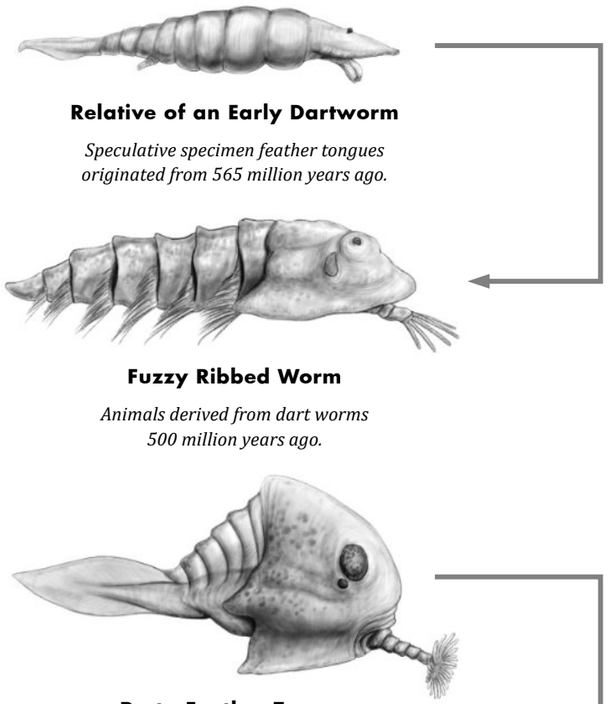
***Lone Feather Tongue.*** *A single feather tongue swims past a reef. A flegelloplumid or "feather whip" is gathering sensory information with its arms before crossing the open ocean floor. Sea stalks suspension feed in the background as marine snow passes over them.*

**The Feather Tongues.** The most recent evolutionary development, a clade known as the feather tongues, is now a focus of exobiological study. Dredgers determined that an abundant source of aquatic microbial life has played a role in altering the environment within the oceans. Oceanic microbes became an untapped food source, causing a large boom in planktonic life. After a few millennia a species of dart worm adapted to life in the water column instead of the sea bed, most likely gaining access to the newly stabilized planktonic populations. These worms continued to radiate into various species, each more suited to life in the open ocean. Eventually after many more millennia, these worms diversified to become the first proto-feather tongues (Pg. 36) that were able to propel

***Butterfly Whale.*** *The specimen above belongs to a genera of feather tongue known as the "butterfly whales", or butterfly feather tongues. Butterfly whales leisurely glide throughout the open ocean and feed on planktonic organisms living in the photic zone.*

themselves through water while simultaneously filter feeding. Descendants of these small filter feeders are referred to as "feather tongues" due to the thin tendrils that make up the feeding crown at the tip of their proboscis; a feeding appendage formed by their protruding rostrum and mouth.

The first and largest taxonomic group of feather tongues are known as the Arcuaderms (meaning "arched skin") also known as the arched feather tongues. These specimens possessed gill-like slits that run down the length of their body, which allows oxygen to easily diffuse through these openings and directly reach musculature used for swimming. As oxygen levels in the oceans increased over time, these delicate entrances became unnecessary



**Relative of an Early Dartworm**

*Speculative specimen feather tongues originated from 565 million years ago.*

**Fuzzy Ribbed Worm**

*Animals derived from dart worms 500 million years ago.*



**Proto-Feather Tongue**

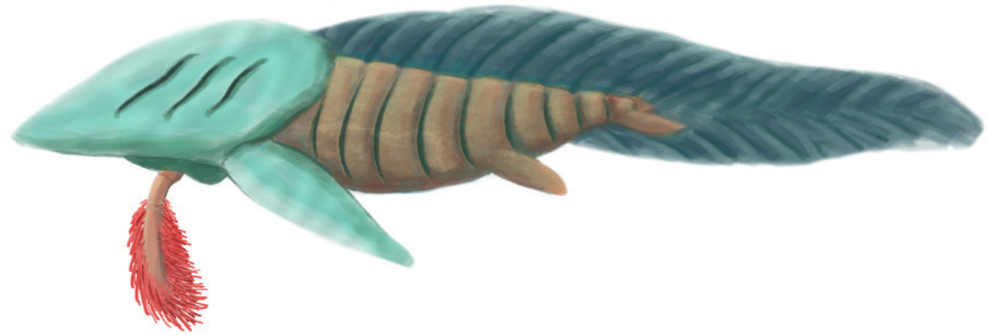
*A morph similar to present feather tongues that appeared 420 million years ago.*



**Arched Feather Tongue**

*Arched feather tongues appeared 207 million years ago.*

***Feather Tongue Evolution.*** *Depictions of the evolutionary development of the feather tongue body plan. It has been speculated that feather tongues diverged from an ancient relative of the dart worm.*



***Arched Feather Tongue.*** *Lateral view of a common arcuaderm or arched feather tongue. This specimen has thinner and more densely packed tendrils on its feeding crown.*

and were enclosed with skin, leaving only a few gill slits near the anterior of the body used for respiration. These arch-less specimens became known as the Propellocaudates, which are considered the first true feather tongue species.

In the oceans of present day Perdita c, Propellocaudates further diverged into a plethora of specialized organisms. Most species still retained their feeding crown, such as the butterfly whales (pg. 35) which possess elongated tendrils broadened outward to increase surface area. Smaller species, such as the small barbell tongues (pg. 33), contain a feeding crown which splits into two distinct branches. These pom-pom-like feeding crowns are able to gently burnish the surface of rocks, substrate, and between sea stalks to lap up microorganisms. The most fearsome and recent group of feather tongues are known as the quill tongue. These creatures have feeding tendrils which have scleritized into a single or multiple sharp spikes which can harpoon prey. Quill tongues hunt by slowly looming over a victim, stalking the prey item until it finds a good time to strike and pull the creature into its mouth cavity.

Life on Perdita c continues to grow and thrive, yielding bizarre life forms compared to the animals from Earth. Time will only tell what other organisms arise.

# KBSE FOCUS: THE AMETHYST BEACH SHIELD

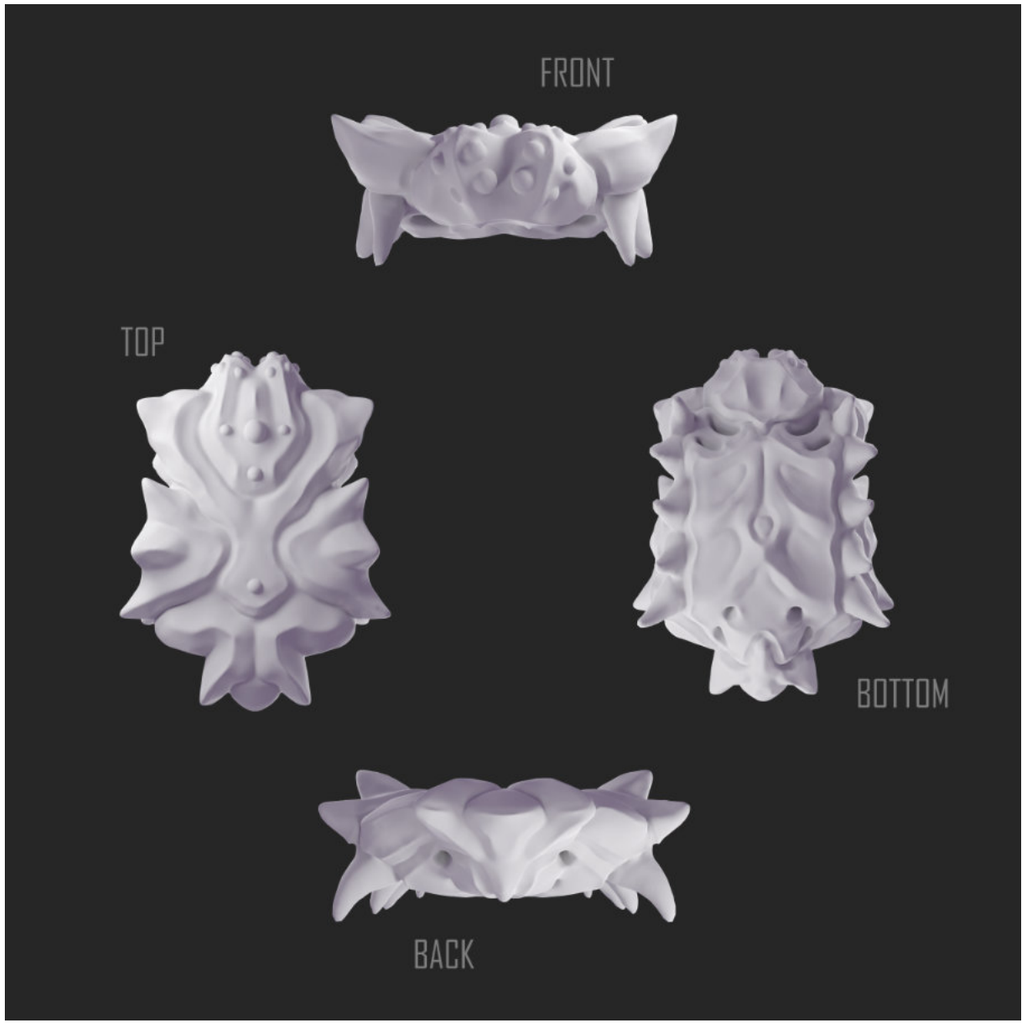
BY MATHIJS MEGENS (FOLDWAVE)

**Made possible by:** Chasla University of Exoplanetary Research and Science
**In collaboration with:** Kirran Biosphere Survey Expedition (KBSE)
**Special thanks to:** Astrovitae Magazine

The White Sea is a vast volcanic region on the northern hemisphere of the planet Kirr Tahan. Characterized by highly saline seas with bright indigo and turquoise waters. This landscape is like no other on the planet, and harbors complex terrestrial and aquatic ecosystems. Out of many species which call it home, one in particular stands out as a must-see on every traveler's list: the amethyst beach shield. Though most beach shield species are small and inconspicuous, the amethyst beach shield can reach a size of up to 50cm (19.7 in) in length, and is adorned with vibrant pink and blue patterns. On calm evenings, this heterotrophic organism can be found leaving the shelter of the shallow waters to forage inland on the many islands of the Chiquon Archipelago. It feeds on various waste products expelled by chemosynthetic gracilicauli (plant-like organisms) that are native to the region. Usually this waste takes the form of pellets and nodules of minerals enriched with proteins and other organic compounds. These compounds are otherwise lacking in the filter feeding diet of the beach shield. Scientists believe that over the course of evolution it will likely lose its filter feeding ability all together in favor of a more terrestrial


***Amethyst Beach Shield.*** *Dorsal view of an amethyst beach shield. Note the graceful pattering on its exterior and the oculi which wrap around its head region.*

***Amethyst Beach Shield.*** *Close-up view of an amethyst beach shield on the shores of the Chiquon Archipelago (KBSE, 55.20-6).*




***Amethyst Beach Shield.*** *Various angles showing the exoskeleton morphology of a specimen. Scan images brought to you by the Chasla University of Exoplanetary Research and Science.*

lifestyle and mineral-based diet.

The function of the vibrant dorsal patterning which gives the amethyst beach shield its name is still the subject of debate, but it is speculated that it aids in camouflaging the organisms as it burrows itself in loose salt deposits. The curved patterning blends-in with the strange salt formations that are characteristic of the White Sea, and the coloration imitates the blue shadows cast by the clear sky. The peculiar burrowing behavior of this organism is rarely observed, but is believed to have a homeostatic function similar to the basking in reptiles on Earth. In rare occurrences, amethyst beach shields congregate on loose salt deposits only leaving their dorsal patterning and oculi visible while burrowing. Through their muscular feet, they absorb minerals and release body heat into the cooler substrate below. It is likely that these deposits contain minerals not readily available in its normal diet, though further research should be conducted to confirm this hypothesis.

The amethyst beach shield is an iconic species and therefore is protected from wildlife trafficking. The only legal example took place in the year 55.23-3 where cryogenic procedures were used to transport 3 Amethyst Beach Shields to the Chasla Xenobotanic Live Herbarium. This was 3 years after the discovery of the species during the Kirran Biosphere Survey Expedition (KBSE). The cryogenic procedures were necessary as the beach shield would likely not have survived the zero-g transport environment. Though not recommended, all Beach Shields were transported safely and are now thriving as part of the Xenobotanic Exhibit of Chemosynthetic Organisms showing the crucial role this vibrant organism plays in the White Sea's terrestrial mineral cycle.

# THE ALTERNATE CENOZOIC PROJECT

BY THIEN ANH NGUYEN

The idea of a present-day Earth where non-avian dinosaurs continue to reign isn't a new one. It had been independently conceptualized and portrayed countless times throughout the history of the Speculative Evolution movement, with notable examples including Dougal Dixon's *The New Dinosaurs* and the ambitious collaborative *Speculative Dinosaur Project*. As a 12-year-old, I created a mini project chronicling such a scenario, with my own bestiary of modern descendants of Mesozoic creatures (which was admittedly horribly plagiarized from the above-mentioned classics). This archaic project was abandoned due to lack of motivation, and as far as I know no traces of it remain today.

During mid 2020, amidst an Instagram paleontology discussion chat, the *Alternate Cenozoic* was kickstarted. Some friends and I were discussing possible scenarios for a world where the non-avian dinosaurs survived the iconic K-Pg mass extinction. The scenario where the infamous comet failed to impact the Yucatan peninsula 66 million years ago was commonly implemented in speculative evolution literature, artwork and projects. However, we discussed vastly different plots. What if the asteroid did strike, albeit with a less intense effect which allowed the great reptiles to push through anyway? And what if the smaller extinction event caused by said comet elicited the evolution of a sapient race, which in turn, caused another episode of

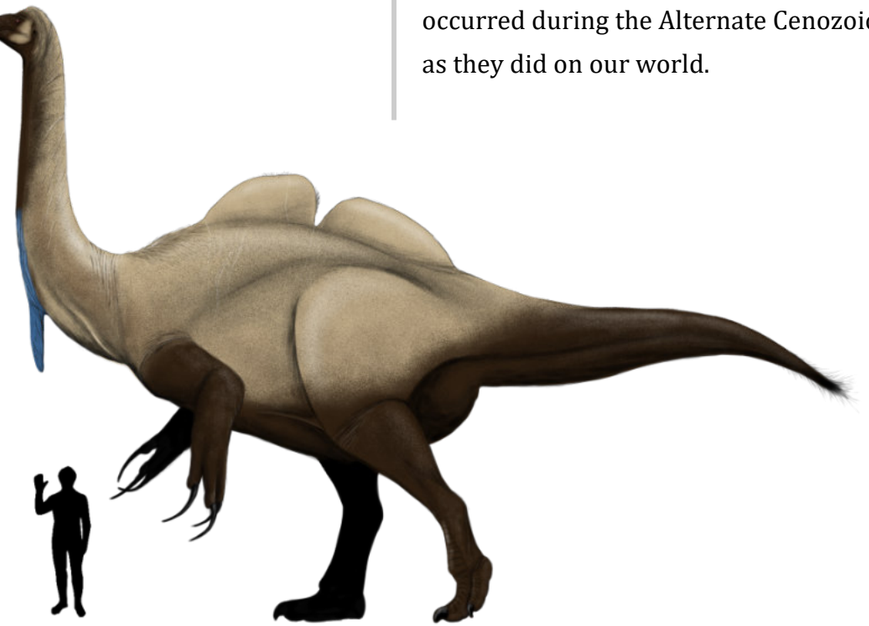
***Iberian Grapplebird.*** *Although Onychornithoides huescae looks very similar to a Dromaeosaurs, grapplebirds are a separate group derived from Troodontids that now occupy niches left empty since the true Dromaeosaurs went extinct in the Late Eocene. With keen eyesight, excellent hearing and switchblade talons, they can take prey well out of their weight class. The scene above depicts an unlucky bonebill ambushed by a hungry grapplebird.*

***Eurasian Direfowl.*** *Torvolestes horridus is one of the largest land predators in the Alternate Cenozoic, the 6m Eurasian Direfowl is dwarfed by predatory Mesozoic theropods due to the cooler, drier conditions it lives in. Nevertheless, it is a fearsome hunter with serrated knife-like teeth that inflicts slicing wounds; and is an omnipresent threat from Spain to Japan. This solitary ambush predator specialises in large game and readily attacks giant Ornithomimosaurs.*

ecological destruction? This is a world where seemingly prehistoric creatures survive, but a significant percentage of iconic taxa were lost to the devastating power of mass extinction. A world where Tyrannosaurs, raptors, Sauropods and Ankylosaurs are completely absent in the modern era. A world where unassuming, long-neglected creatures like Troodonts, Parksosaurs, Ornithomimosaurs and Alvarezsaurs rise to claim dominant ecological statuses. I began sketching creature concepts for this new scenario.

Among those preliminary concepts were Tyrannosaur-like Troodontid descendants, gigantic Therizinosaur-like Ornithomimosaur browsers, grazing cursorial Parksosaurs with crazy ornamental headgear, seagoing Metriorhynchid-like Choristoderes, and, interestingly, some suspiciously kangaroo-like marsupials. Most of these concepts are luckily retained into the project canon, which itself is now still very insufficient and undeniably a work in progress. They will eventually be featured in my expanding collection of speculative creatures!

The Alternate Cenozoic Project takes place during the Holocene ("modern day era") of an alternate planet Earth ravaged by the aforementioned alternate circumstances. The positioning and geographical features of each landmass are identical with our timeline's Earth, except for some minor details such as the lack of an asteroid impact crater at the Chixculub area. Throughout the Alternate Cenozoic, climatic trends and variations (ignoring the significant mass extinctions) happened similarly as our own timeline. Biogeological and climatic events like the Paleocene-Eocene Thermal Maximum, the Pleistocene ice ages, the Glaciation of Antarctica and the Great American Biotic Interchange occurred during the Alternate Cenozoic as they did on our world.



***Asiatic Gargoose.*** *Towering at 8m tall and weighing 8 tons, Seismornithomimus colossaeus is the largest land animal in the Alternate Cenozoic and one of the largest theropods to ever live. This massive Ornithomimosaur assumed the heavyweight browser role previously occupied by the now-extinct Sauropods, feeding on the tallest treetops inaccessible to other herbivores.*

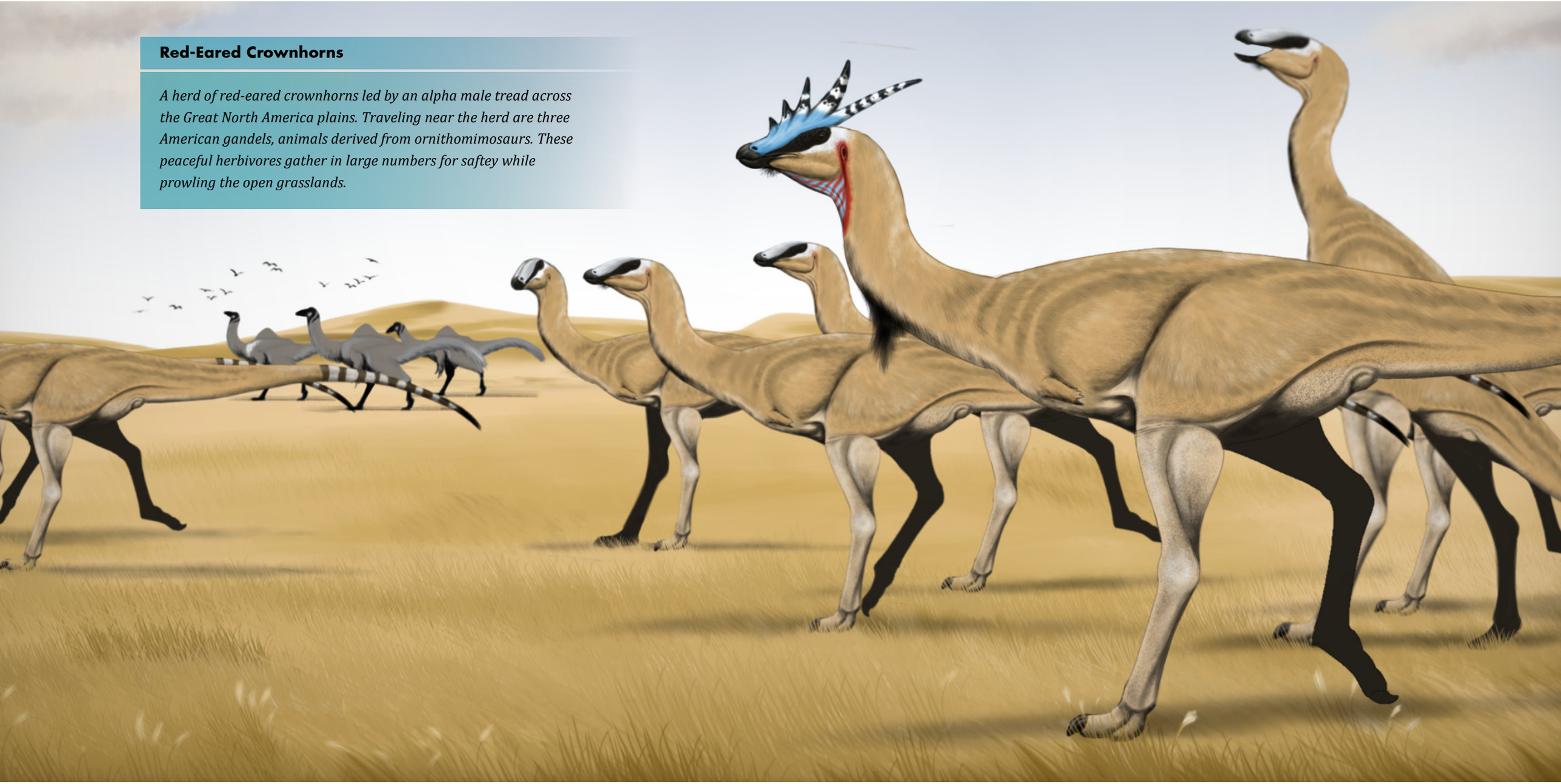
***Pantanal Serpenthead.*** *Hydrophisaurus natans is an aberrant member of the last remaining lineages of Ceratosaurs – scaly, primitive, archetypal theropod dinosaurs, are now agile semi-aquatic swimmers dwelling in the tropical rivers of South America. The serpenthead's long, almost Plesiosaur-like neck provides considerable striking range, and its interlocking conical teeth help ensnare slippery prey including small fish and frogs.*

Instead of the conventional mammals and birds that dominate virtually all biomes of home Earth, the Alternate Cenozoic is home to the descendants of the non-avian dinosaurs, as well as other Mesozoic fauna, that managed to endure the extinction events thrown at them. This project examines and follows these new generations of terrible reptiles and how they adapt to and thrive in conditions familiar to our own real world, as well as the aberrant ecosystems they live in.

Creating and maintaining the Alternate Cenozoic Project has continued to be an exciting experience for me. It is primarily an exercise for my artistic techniques and creative skills, concerning areas such as creature design and world building. Although I usually undergo quite laborious processes in order to produce adequately detailed lore, species and taxa, profiles and posts in general, I genuinely enjoy illustrating and writing for this project and the fascinating creatures that constitute its

***Hirsutorn.*** *Hirsutornis mirabilis, also known as the Hirsutorn is descended from Troodontids which expanded into niches left by extinct Therizinosaurs. This incredibly hardy tundra dweller feeds upon forbs, lichens, grasses and occasionally carrion. Unlike other large herbivores, they don't migrate; instead withstanding the hostile conditions of the Arctic winter year-round and breeding during summer.*

canon. A lot of people seemed to have positive reactions to my project as well, to which I am absolutely delighted and honored! It also reminds me of how far I've come since my hilariously scrapped first steps into speculative evolution. Since the Alternate Cenozoic is currently Instagram-exclusive, Astrovitae has been a great first opportunity for me to share the work to a wider audience, and I will hopefully expand my project to other platforms as it becomes more well-established.



**Red-Eared Crownhorns**

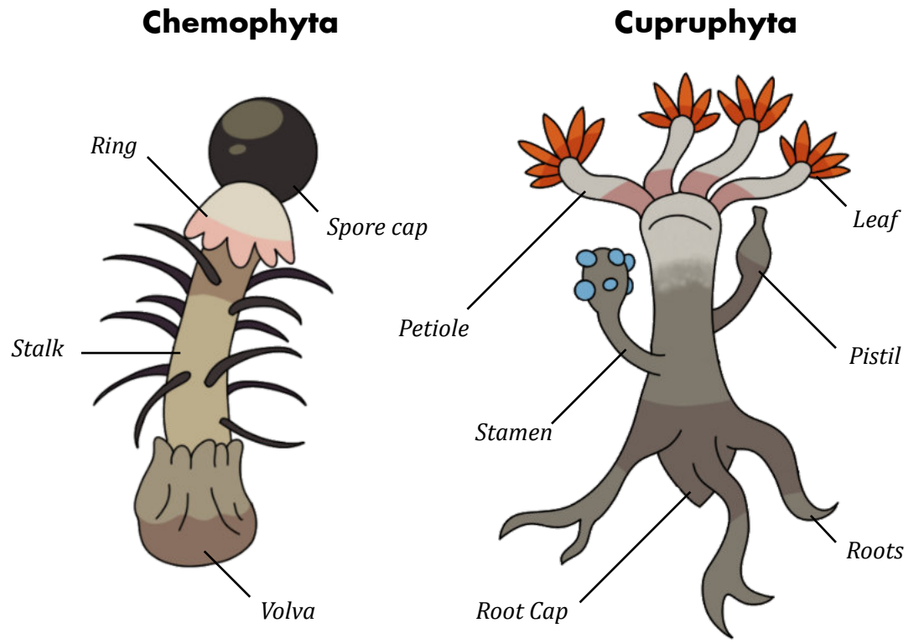
*A herd of red-eared crownhorns led by an alpha male tread across the Great North America plains. Traveling near the herd are three American gandels, animals derived from ornithomimosaurs. These peaceful herbivores gather in large numbers for saftey while prowling the open grasslands.*

# BEFORE PLANET FENI

BY EVAN PROCTOR

In the year 2036, a project known as Breakthrough Starshot sent hundreds of drones to the planet Proxima Centauri B, equipped with high tech cameras and advanced scanning technology. When the drones arrived they took pictures and sent them back to Earth. The first batch of images were astonishing and contained images of lifeforms. When the world saw the success of project Starshot, researchers sent even more autonomous drones into space in search of other forms of life. This action proved successful, and led many countries around the globe to send robots to various planets across the galaxy. Organic samples, videos, sounds, and images were captured and taken back to Earth for processing. This was a breakthrough for humanity — but it is now time to take the next step.

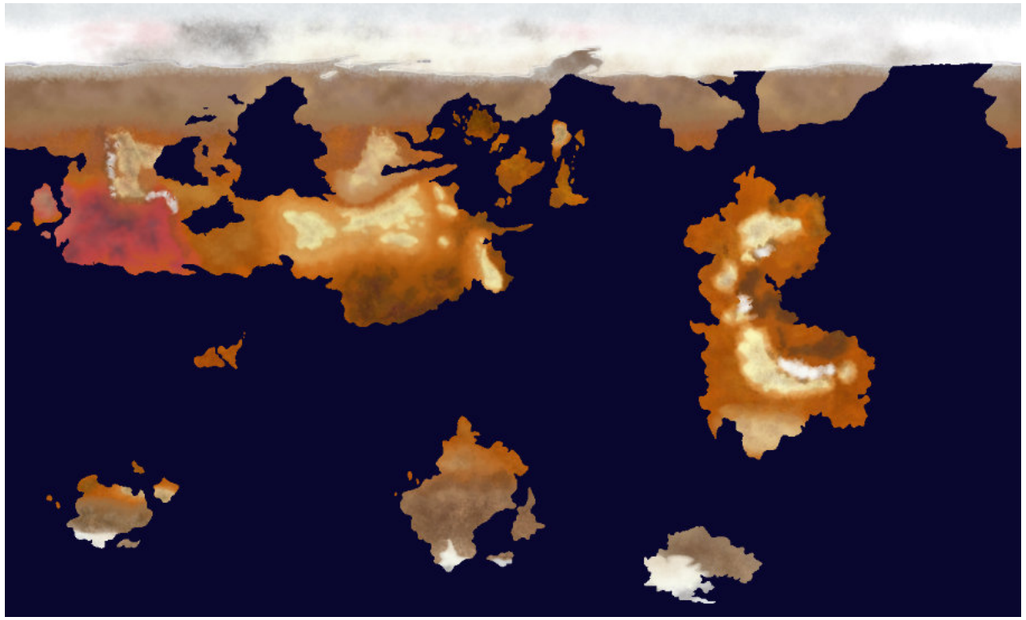
Certain political and ethical problems would start on Earth causing an event known as the Final War, nearly killing off all humans entirely and leaving its population to only 4 billion. In order to change their ways, humanity left the Earth and their early Mars colony behind forever. With this, they began to spread across the solar system. Terraforming Venus and making bases on the moon to watch over the abandoned Earth. Life was stable and it proceeded to flourish. Humanity soon left the solar system in search of the very aliens they once saw centuries ago. When doing so they were contacted by an alien intelligence. An ancient race of beings that wish to spread peace and life across the universe. They had one simple request. For humanity to join them on this mission, which the humans humbly




***Feni Flora.*** *Both Chemophyta and Cupruphyta are endemic throughout all of Feni. Chemophytes are more successful than Cupruphytes, as some species are aquatic and can even thrive on ocean vents.*

accepted. Humanity quickly advanced thanks to this new intergalactic civilization. This group humanity joined was called the New Galactic Federation, and it was millions of years old prior to their acceptance into the federation. Together, the federation helped keep peace throughout the galaxy and help young civilizations thrive.

**Fauna of Feni.** In Feni's past there were many phyla that existed but most of those ancient creatures went extinct in recent years. The surviving nine phyla were the Brachiostoma, Heliostraca, Peltalespis, Radiopodia, Ptilopodia, Xenocaris, Chemophyta, Petriphyta, and Cupruphyta. The Brachiostomes are the dominant large lifeforms on Feni. The major divisions are very different from each other. The Eustomes kept their unique mouth structure while the Synostomes fused it with their head, giving it an Earth-like look. The Heliostraca get their name from their



***Satellight Map of Feni.*** *In the Northwest lies two large continents, Oarao (left) connected by a land bridge with Vibamin (right). The third largest continent of Pagtor is broken off and is surrounded on all sides by ocean. The three continents in the South are Kin (left), Sheshou (middle), and Rosepen (right).*

shells that vaguely look like rays of light from a simple sun drawing. These spines typically are full of toxins to protect themselves. Peltalespis are arthropod-like creatures that have replaced most aquatic Brachiostomes, taking up a fish-like role. Only a single line has made it onto land and are worm-like. The Radiopods are the only surviving radially symmetric animals on Feni. They are slow moving and make up a good chunk of aquatic and aerial plankton. Ptilopods are a strange group of creatures since their tails stick out of the group, but their tails also have their mouth and feeding limbs. They can't move once they find a spot to mature. Xenocaris have no aquatic relatives anymore. They are very insect-like though they are shaped more like crustaceans.

**Flora of Feni.** There are three main plant phyla on Feni. The Chemophytes (pictured on Pg. 53) who use chemosynthesis instead of photosynthesis, due to the abundance of hydrogen sulfide in the atmosphere. They tend to be dark in color and have evolved into lichen-like decomposers. The Petriphyta are hard and are similar to corals. These plants are orange in color and can be found in water and on land. They are very hardy plants and are very successful in drier climates. The Cupruphytes (Pg. 53) are also orange in color, which is why they are known as the Cupruphyta (it means "copper plant").

**Sapient Life.** Feni has its own intelligent species called the Pithecosaurs, or more commonly known as the "Zalic". These creatures belong to the group called Synostomes, and there are several distinct species of Zalic classified within it. Their history and culture is long and diverse. They had once evolved from arboreal bird-like animals into intelligent beings, eventually adjusting to living life outside of trees. Zalics are sexually dimorphic, meaning that genders differ from each other physically. On average females tend to be bigger and stronger than the males. Males have colorful spots of fur that they once used to attract females.

***Female Pithecosaur Sapien.*** *The Pithecosaurs are among the smartest species on planet Feni and possess interesting bioluminescent spots for complex communication. Their orange coloration helps the specimen blend in with the surrounding foliage.*

# THE WORLD OF NIJIN-KONAI

BY LORENZO BATTILANI

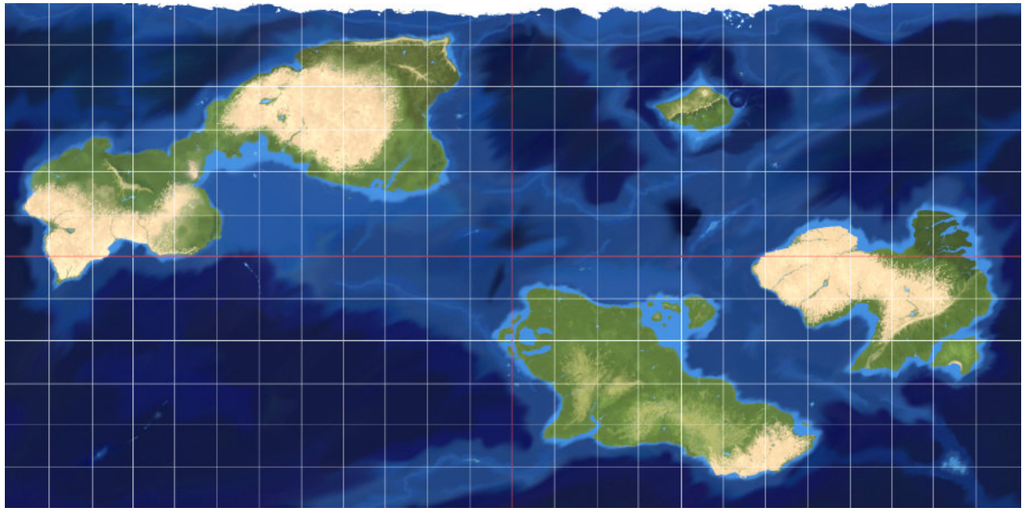
Nijin-Konai is the result of an ongoing project of speculative biology seven years in the making, set on a distant planet. As part of this project a series of books will be produced, each volume consisting of a collection of field guides each about one major phylum from the planet. The first book in production will be about Ichthyomorphs, a subphylum of chordate fish-like organisms from the world's oceans.

This article will be focusing on Polychordates specifically, a phylum that comprises all Ichthyomorpha, but will also offer a general overview of life on the planet.

**Planetary Overview.** Nijin-Konai is the fifth planet orbiting Nijin-Laj, an F8V class hyperactive star. Due to solar conditions, the planet is enveloped in UV radiation, enough to be lethal to humans (2000-6000 mSv/day). Nijin-Konai has hyposaline and brackish oceans, which impede osmotic functions for the planet's inhabitants. This caused many organisms to develop strange and unique adaptations to overcome and thrive in these harsh conditions.

**Origin of Life.** Pluricellular life on Nijin-Konai first appeared in the fossil record around 830 million years ago near hydrothermal vents. The development of an enzyme, TRSE β-e54 DNA Prostatase, was key in the initial colonization of surface waters and intertidal zones. TRSE β-e54 DNA Prostatase coils around the genome and acts as a shield, fixing the genes and mostly avoiding mutations and radiolysis from occurring. Redundancies in the genome for genes like rad51, used in genome repair, also play a role in surviving solar radiation. Of the six major phyla still extant on the planet, three have some form of endoskeletal structure. Pleuropoda, a relatively simple phylum of radio-mixotrophic chordate organisms. These very successful animals cover most airborne niches, from pollinators to large marine flying predators. Pleuropods are the most efficient at counteracting the radiation, which makes them flourish outside the water. Osteophyta are sessile chordate-like organisms that cover the role that plant life would occupy on Earth. These plantlike chordates can be both purely

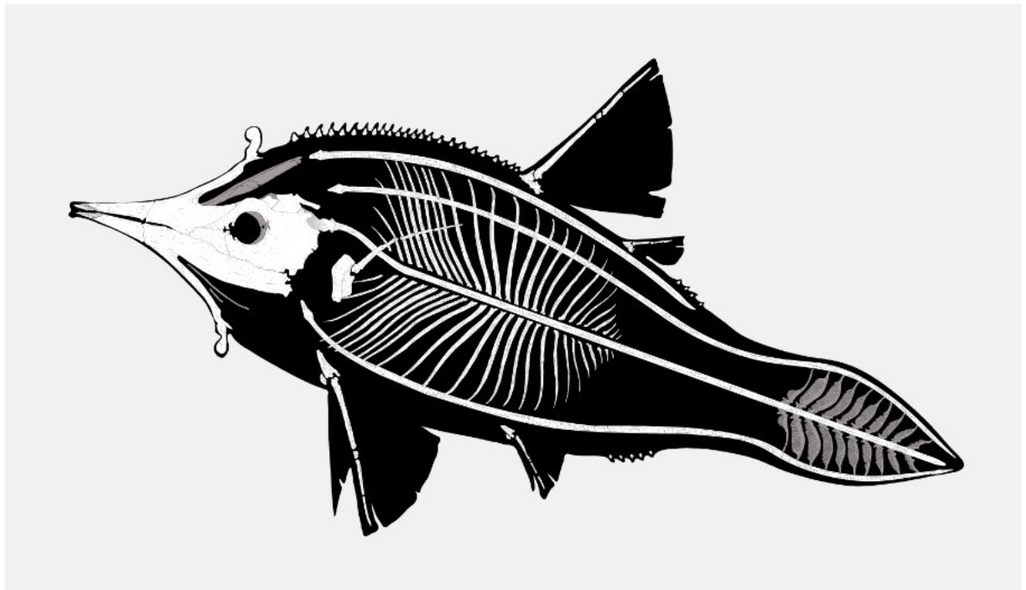
***Reaching Below.*** *Radar Kugawa (Protokugawa rantar) reaches into the under-reef using its powerful electroreception to pinpoint prey.*



***Nijin-konai grande.*** *A satellite map of the planet of Nijin-Konai during a regular radiation day.*

autotrophic or assume a more mixotrophic lifestyle, hunting or scavenging along with the radio-phototrophic functions common to the phylum. Most osteophytes retract underground when in danger, either from predation or the frequent solar storms that ravage the planet's surface.

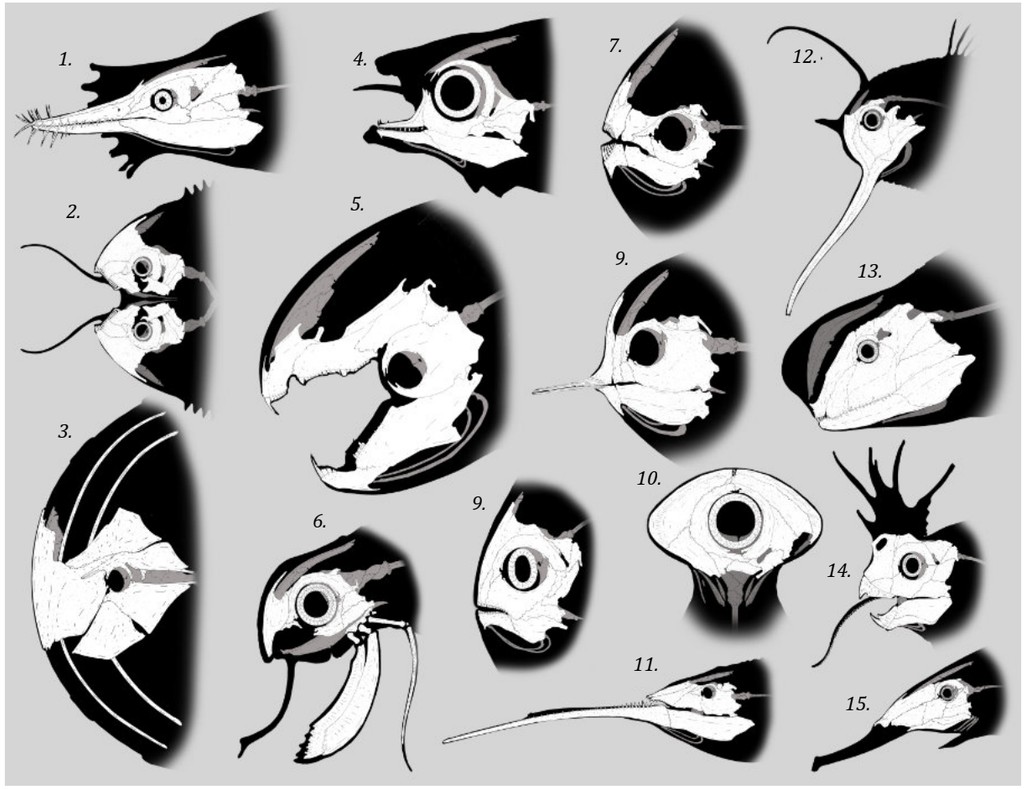
Along the equatorial regions Osteophytes typically remain underground during the day and only surface at night. Abranchiates are the major invertebrate phylum on Nijin-Konai, like all invertebrate phyla on the planet, are almost exclusively aquatic and dominate the benthonic environments. Most abranchiates evolved strongly mineralized exoskeletons, many of which with high concentrations of Biogenic silica (bSi) and iron to supplement the scarcity of calcium carbonates in the oceans. Athliosfaira, one of the most aetherial phyla on the planet. Usually called "trawlers", these invertebrates from the depths of the planet emit soft bioluminescence to attract smaller organisms that stick onto their skin and eventually get absorbed. Skiadeiocephala is the second most numerous phylum of invertebrates on the planet.



***Heraldic Kika.*** *A full skeleton reconstruction of a Heraldic Kika (Kika kika), a Philloichthyd Hijerakid Ichthyomorph from the Coralline Osteophyte reefs of the Gulf Sea.*

The majority of the members of this phylum are to some extent radiotrophic, with entire lineages being autotrophic. Skiadeiocephalans are usually soft-bodied, with only a few members showcasing any degree of mineralization. Polychordata, a large clade of non-cephalized organisms found in almost every environment on the planet.

**The Polychordata.** Polychordata are characterized by six elastic spine-like structures, called “columnae flexibiles”, which offer the animal calcium storage and structural support. Polychordates breathe through their gill tail and skin, thanks to their subcutaneous circulatory system. This system is especially useful in aquatic environments, allowing for oxygen exchange directly from the skin. Polychordates are not cephalized organisms. Their cerebrum is divided into two main sections, the cranial and spinal cerebrum. This highly regionalized brain allows the animals to optimize




***Ichthyomorpha.*** *A collection of cranial skeletal diagrams from Ichthyomorphs across most subphylum: 1.) Exsertognathus lolligii, 2.) Diplolingua harenostriatus, 3.) Ithmotitan discus, 4.) Aurorichthys tenuimaxillae, 5.) Chalybomaxillae fulmineus, 6.) Kugawa gigas, 7.) Anamothia communis, Gricilirostrum conchaedelendii, 9.) Esavelis communis, 10.) Astoma inespectatus, 11.) Lanceamentum prodigus, 12.) Eulampignathus eptazona, 13.) Cetosaurichthys globifrons, 14.) Psittacosteocristomimus fortirostris, 15.) Planiventrostomus kanyagarii*

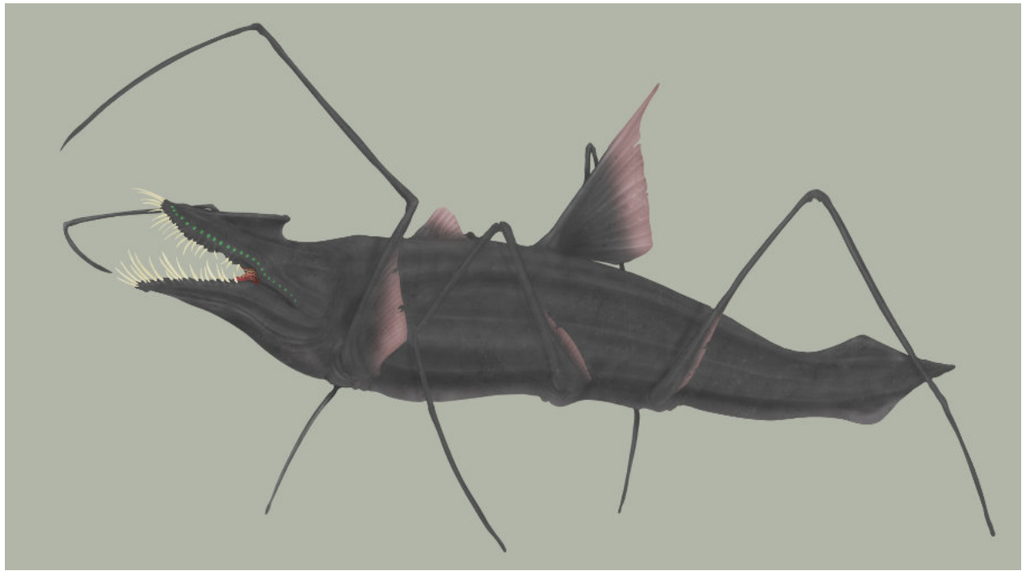
energy usage for the maintenance of more complex body plans. Polychordate neurons come in two shapes, regional neurons and long-distance communication neurons, with long branching axons that allow for long-distance synapses to occur along the length of the organism. Polychordate mastication happens through a specialized structure, the “lanial apparatus”. The Lanial apparatus (Pg. 63) is made of several osteological components that work together in actioning a spherical organ that sits in a socket inside the mouth. The joint effort of these bones and muscles allow these animals to chew food with the use of this specialized structure, derived from an ancestral structure called the radular tongue.

Inside the mouth is also the palatine ear, a hearing organ composed of thousands of millimetre thin laminae that catch vibrations in fluids and transmits the information through a bony shaft to the “palmoreceptor”. The soft palate closes the ear when the animal is eating, protecting the organ from damage at the cost of limiting its hearing. The ear is also a basal structure that has remained unchanged throughout its evolutionary history.

**Coloration.** Polychordates are extremely colorful animals, usually boasting very complex patterns with plenty of flashy colors that, to us, would look impractical for survival.

This patterning is highly influenced by Polychordate eye structure. The Polychordate eye, also called a chloroplast eye, uses dozens of photoradiosynthetic molecules to catch a wide spectrum of light and transmit the information to the cranial cerebrum. This not only gives the animal much better color vision compared to ours, but also allows them to actively decide which colors will be seen and which can be tuned out. The complex patterning of Polychordates is therefore a form of camouflage, either forcing a potential threat to look for additional colors (making the prey less visible against the background) or to only see one skin color (making them unable to distinguish shapes due to the intricate patterning).

**Respiration.** Respiration in Polychordates is carried out simultaneously by two major apparatuses (three in the case of

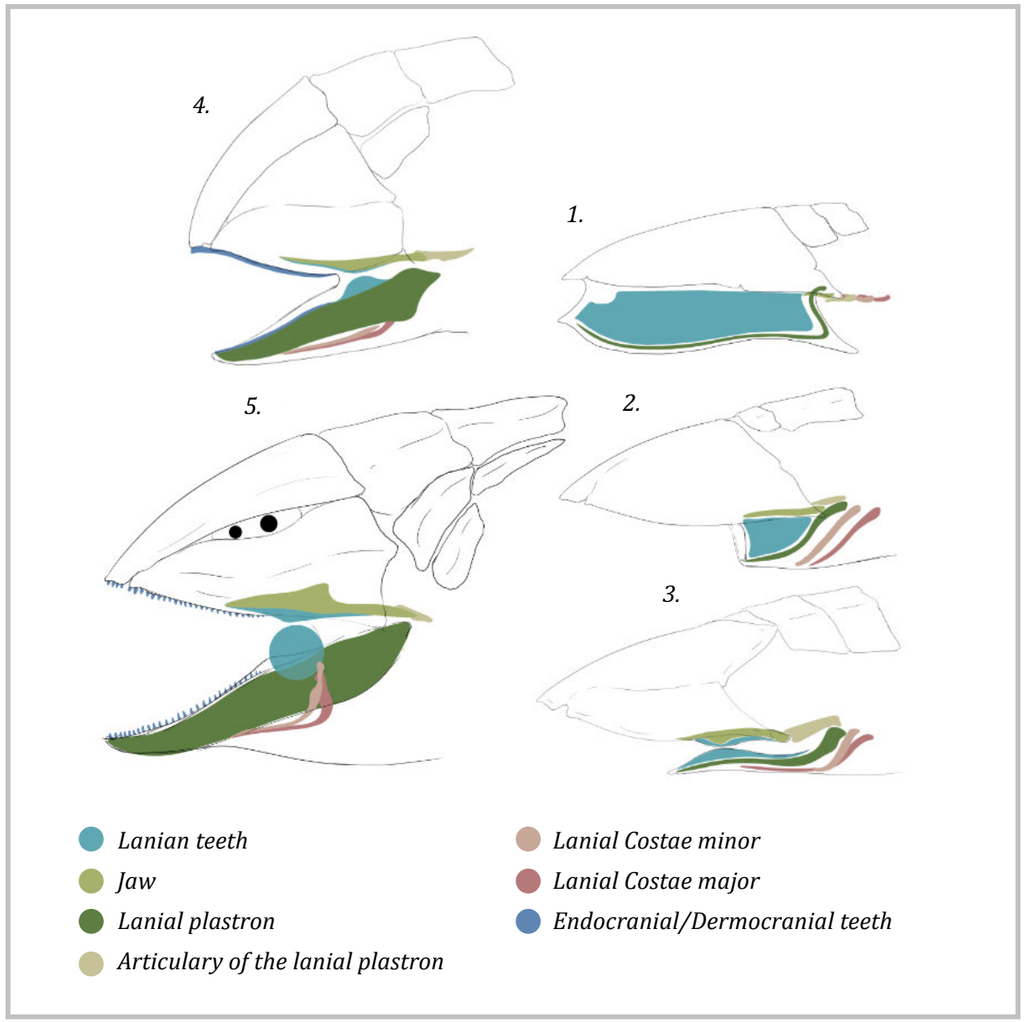


***Walking Reaper.*** *Illustration depicting the lateral view of a walking reaper. It's complex skull and jaw musculature is explained on Pg. 65.*

multipurpose organ, the Filtration Sac. The principal respiratory apparatus is not too dissimilar from a tetrapod's lungs.

A series of around twenty nostrils on the fan at the end of the tail takes in water, helped by the movement of the tail. The water is then sent to the Filtration Sac, in which free oxygen is extracted and sent to the pseudo-pulmonary sac, where gas exchange occurs and the oxygen is distributed into the bloodstream. The second respiratory apparatus is composed of a sub-cutaneous system of capillaries and veins, filled with water instead of blood.

This subcutaneous circulatory system (SCS) is of vital importance to Polychordates and has several major functions: respiration, osmotic functions, thermoregulation, hydration, bioelectric channelling, and buoyancy. The water inside the SCS helps the animal absorb oxygen directly from the environment and retain Calcium and Sodium inside two different types of dedicated structures. Waste gases, such as CO2, are diffused from the skin into the

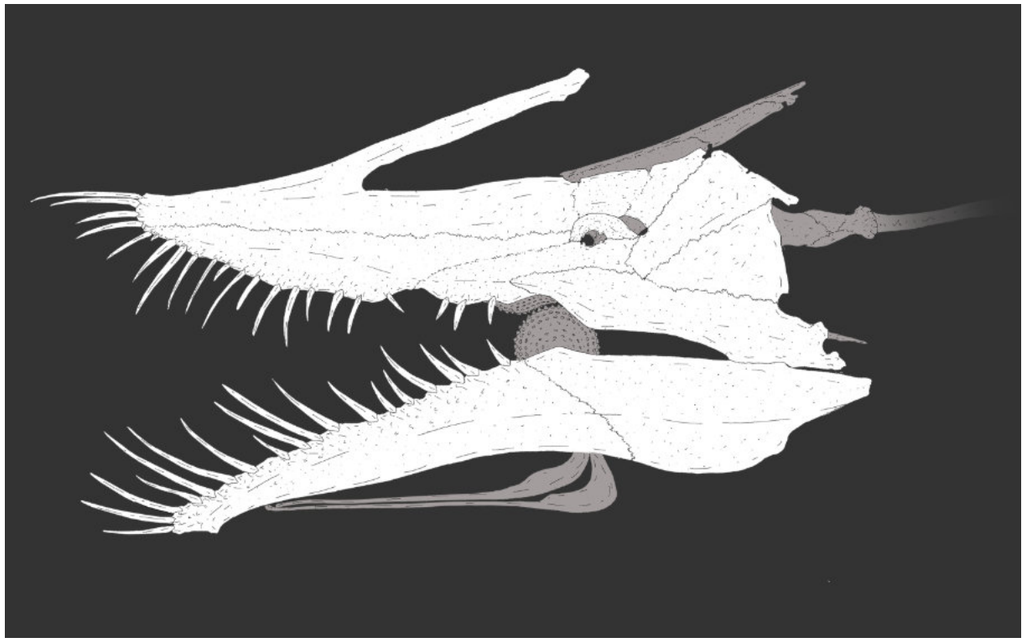



***The Lanial Apparatus.*** *Jaw and lanial apparatus in Polychordates; 1.) The radular tongue creates a wide triangle-shaped membrane sustained by a main beam along its length, the beam is able to bend and move to grind food, 2.) The radular tongue recedes as the formation of a masticatory sac in the tubular mouth is developed, 3.) The lanial teeth specialize and more joints appear to allow for the movement of the pseudo-mouth and the passage of larger and more complex foods, 4.) Completion of jaw development with specialized teeth to grasp food, initial separation of the sphaera lania into its separate joint, 5.) First appearance of a proper sphaera lania.*

**Sandlurker**

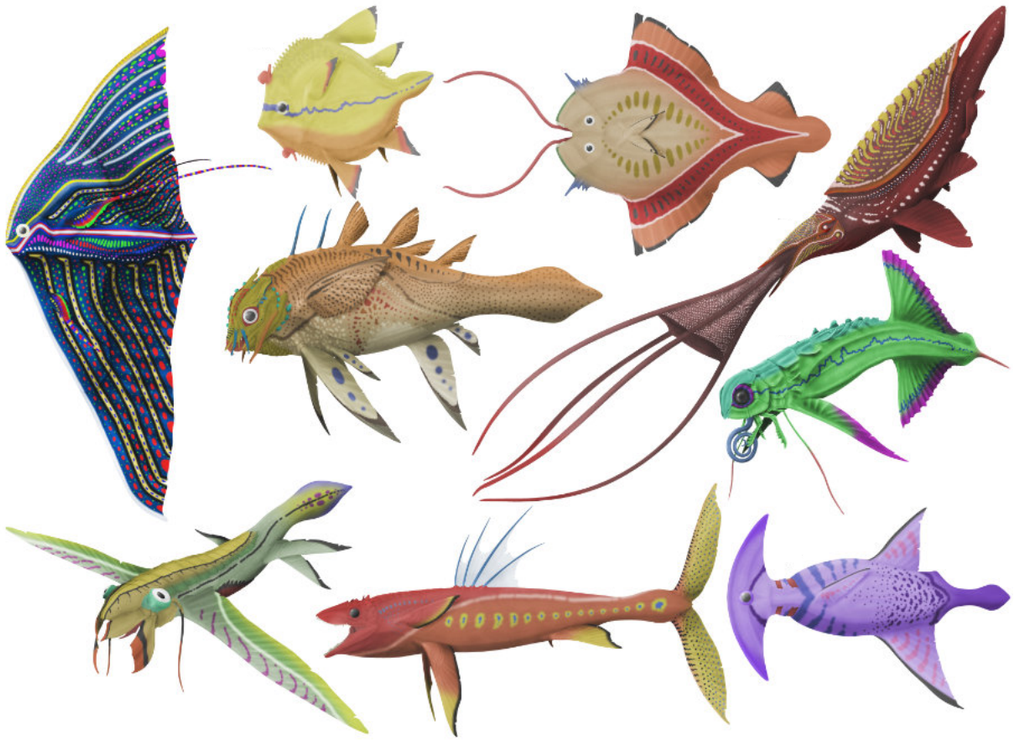
*The photo taken in 2547 of a Tooth Collector Sandlurker eating a couple of shed teeth for calcium, this photo is one of the few sightings of this animal and where it got its name from.*





***Walking Reaper Sphaera.*** *The movement of the Lanial Costae Minor, through the contraction of the m. adductor lanialis minor, is alternated much like the pistons moving a train's wheel, allowing for the constant rotation of the Sphaera Lania inside its socket. The opening of the mouth forces the Stemothyrohyoid muscle to push the sphaera out of the socket it lays in, movement helped by the Lanial Costa Major, which creates the pressure between the Sphaera Lania and Lanial Plastron needed to masticate food properly.*

environment thanks to the many areas of interconnection between the Circulatory system and the SCS. By using the first and third skin layers to insulate or excite water molecules (through friction between the layers), Polychordates can regulate their temperature efficiently. The Polychordate reproductive system can be situated in two different areas depending on the gender: males possess a parapenile extension on the upper chest, while females have an oviduct leading to three to seven ovaries deep into the cranial area. Mating in Polychordates requires the male to either swim on top of the female, or for the latter to sit down and allow the male to climb on top to reach the opening.



***Ichthyomorphs.*** *The collection of specimens above show the peculiar coloration and elaborate patterns found on most Polychordates throughout Nijin-Konai.*

The parapenile extension is prehensile and the male can easily reach into the oviduct and fertilize each ovary.

**Reproduction.** Polychordates mostly develop inside eggs that are laid by the mother, although ovovivipary has also independently evolved several times in the phylum. The fetus, when ready to hatch, will use a modified first cranial plate, called the natal aculeus, to pierce the egg and, by rotating inside the shell, cut their way out. The natal aculeus is often discarded or absorbed a few weeks from birth, but in some cases it is neotenized into a defensive structure near the head. Wheter natal aculei are discarded or absorbed is usually due to the birthing behaviour of the species. Ovivivipar ous clades usually give birth to young with underdeveloped and blunt

***Perilous Stiltfishing.*** *A group of Stiltfishers in the outer Najeete marshes is ambushed by a Fiery Riverdragon (Flumidracon emperator). In the background, the bluish colours of some of the osteophytes is a sign of a high radiation day.*

natal aculei, which are oftentimes absorbed into the first cranial plate as the dermocranium finishes developing. Oviparous clades have their young born with much more developed natal aculei that are often discarded as the final ossification of the plate underneath it cuts it off of the organism.

Many terrestrial Polychordates will eat their own natal aculei upon discarding them to reintegrate minerals, but in aquatic environments, these are often lost in the depths, where other organisms, such as sandlurkers may pick them up to eat.

Nijin-Konai was built on the premise of creating a world that could be plausible enough to sound real, and to do so I had to employ various subjects in the natural sciences to a high level of depth. Next Issue I'll go more in-depth in describing specializations inside of this phylum, showcasing more of the variety inside of it.

# SEA SERPENTS OF THE ARTECHOCENE

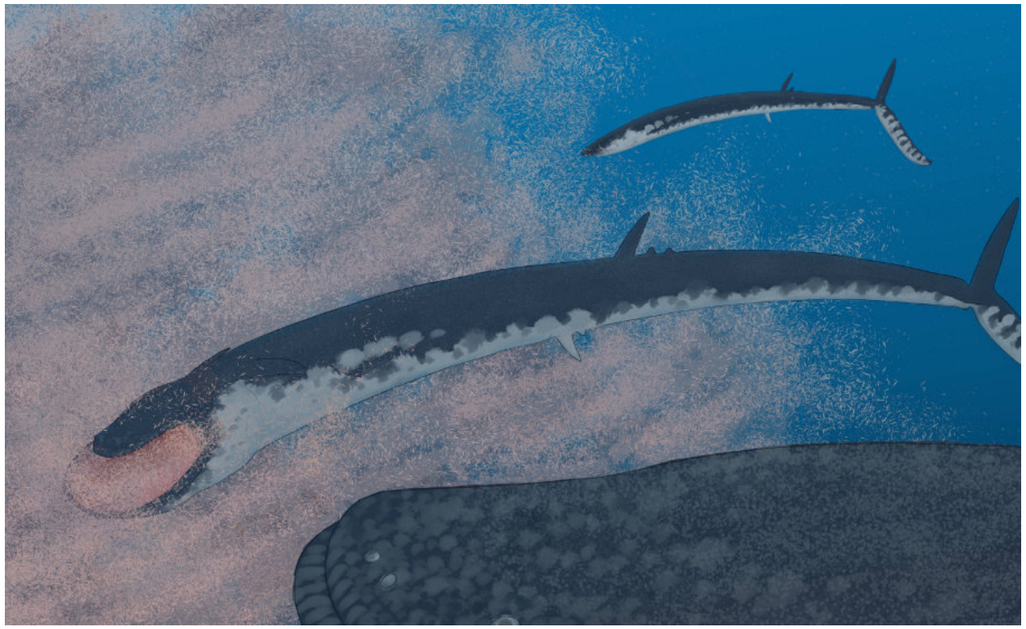
## The Rise of The Tiamats

BY ALEJANDRO MARTÍNEZ FLUXÁ

The Anthropogenic mass extinction event was devastating for Earth, as mass extinctions tend to be, but the oceans got hit especially hard. Pollution, acidification, rapid warming of the waters and overfishing among a plethora of other factors, left the oceans almost devoid of life like in the tropics. Only the most adaptable of animals survived, including a few species of the mammalian groups that had dominated the oceans during pre-anthropogenic times, like dolphins and seals. These mammals diversified after the extinction and then slowly declined as the glacial periods became less frequent and the climate began to warm up. The late Post-Anthropocene period saw the extinction of seals and other pinnipeds, while dolphins decreased in diversity before dying off shortly after pinnipeds. While all of this was happening several groups of marine reptiles had been waiting in the shadows for their time to shine. One of these groups were the Cetophidians, a clade which diverged from modern day sea snakes.

The Cetophidians descend from a pelagic branch of the sea snake family tree. With their tolerance of warm climates, small size, varied diet and the ability to absorb high quantities of heavy metals with minimal tissue damage, these little sea serpents were destined for greatness. With the extinction of many pelagic predatory fish groups, the snakes evolved to take the niches of high speed open water predators, like the extinct tuna, swordfish and alike in the warm equatorial oceans of the Pacific and Indian oceans. The Cetophidians saw several key morphological changes, such as a stiffened spine, larger tail musculature and a cartilaginous tail, and rib fins which evolved intro proper pectoral, anal, caudal and dorsal fins. These anatomical changes altered the snakes in ways that made them look more like fish than reptiles.

With vacant niches in need to be filled across the oceans, and a warming climate at the boundary between the Postantropocene and the Artechocene, the newly evolved tiamats evolved to swallow larger schools of prey. Their teeth size decreased and were designed



***Feeding Tiamats.*** *Depicted above is a pod of Antarctic Tiamats (Cetophis antarcticus) feeding in frenzy around a large krill swarm in the waters near the Antarctican mainland during the Early Artechocene.*

## Non-Tiamat Cetophidian

**Zebra Serfish**
*Paracetophis listatus*
~3.5m (11.5 ft) in length

## Tiamat Cetophidian

*Tiamats travel in large groups of unrelated individuals in order to more easily find and catch food, as well as to detect predators more effectively. As adolescents, adult tiamats migrate towards their feeding grounds around coastlines in order to grow to their giant sizes.*

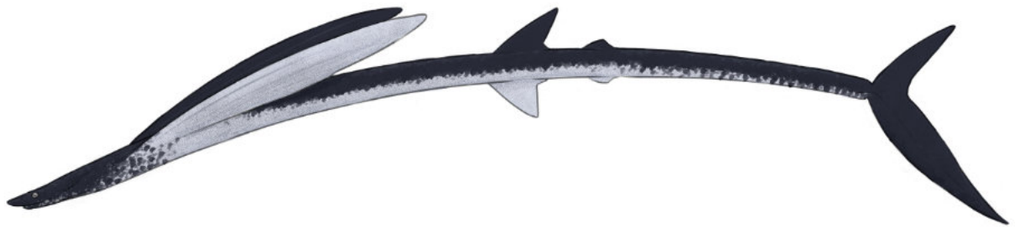
**Four-Horned Tiamat**
*Ceratocetophis daemonicus*
~10m (32.8 ft) in length

**Spotted Tiamat**
*Nanocetophis pygmaeus*
~5m (16.4 ft) in length

**Bigfin Tiamat**
*Pmetamorphis megaloptera*
~7m (23 ft) in length

**Antarctic Tiamat**
*Cetophis antarcticus*
~13m (42.6 ft) in length

**Twilight Tiamat**
*Caligocetophis niger*
~8m (26 ft) in length



***Juvenile Bigfin Tiamat.*** *Some juvenile tiamats, such as the juvenile bigfin tiamat, have huge pectoral fins reinforced with extra cartilage. They can use their cartilaginous fins to glide above the water's surface for a short period of time. This trait may had evolved in order to survive the overcrowded Caribbean, which is a common breeding ground for a lot of larger tiamat species.*

to filter out water from food similar to how baleen functions in present day whales. These tiamats rapidly grew in size due to the lack of competition, and easily diversified to exploit different areas with unique kinds of prey to eat.

The main things that are shared between all tiamats are their very large, highly flexible jaws that allow them to engulf large amounts of prey in one go. Their jaws are so big they can sometimes be twice as long as the rest of the skull. The ribs that form their pectoral fins are fused into a single structure, which makes it much better for maneuvering in water. But one of the more unique characteristics of tiamats is the fact that they undergo significant dietary and morphological changes throughout their lives. Juvenile tiamats start as fast moving pursuit predators, with hooked teeth to hold prey more effectively, and as they grow their jaws enlarge. Adults develop a smaller and more densely packed dentition in order to efficiently filter feed. These changes in some cases can be very extreme, like in the case of the tiamats in the Metamorphis genus, where the young are almost unrecognizable when compared to the adults and were previously thought to be separate species.

**The Last of the Non-Tiamat Cetophidians.** When tiamats began to evolve, their young fed on the same prey many non-tiamat Cetophidians were already feeding on. Tiamats developed cooperative hunting strategies, more flexible jaws, and fins with greater maneuverability made them much better hunters than their non-tiamat relatives. This fierce competition combined with rapid climate change drove Cetophidians to near extinction. Only one genus managed to hold on to the ancestral waters, the equatorial areas of the Pacific Ocean, where their ancestors evolved.

This genus was Paracetophis, also called the serfish. Unlike tiamats, they don't abandon the lifestyle of fast pursuit predators in adulthood, nor do they abandon the reefs and tropical shallow waters they are born in. Overtime they have become one of the main predators inhabiting oceanic ecosystems. Serfish retained some ancestral characteristics of their lineage, like detached bones within their fins and even the ability to produce venom to paralyze prey. They are also known to be one of the main predators of newborn tiamats, with a large group of more than twenty individuals having observed congregating around birthing females for a meal.

***Thyreostracan.*** *A thyreostracan, one of the largest terrestrial anthostomes, with some small flying opisthopterans, to whom it is distantly-related, perched on its humped shell. (Image by bombynx280)*

# ARTIST SPOTLIGHT

# Alien Biospheres

## A Look at Life on Planet Tira 292b

BY BIBLARIDION

Ever since I first watched the BBC's *Walking with Dinosaurs* at the age of five, I have been captivated by biology, paleontology, and evolution, and I was later introduced to speculative biology by works such as *The Future is Wild*, Wayne Barlowe's *Expedition*, and C.M. Kösemen's *Snaiad*. Over my life I have made at least seven alien planets, the most recent of which, TIRA 292b, I have endeavored to document in a series of videos on my Youtube channel (though the planet's name has not yet been overtly stated in the series itself).

When I began the *Alien Biospheres* series in July of 2019, I originally envisioned it as a simple tutorial to introduce the viewer to the basics of evolutionary biology, using a fictional biosphere to provide examples of the concepts under discussion. However, as the series has progressed, the audience has become increasingly invested in the planet in its own right, and it has since grown into one of the biggest and most complex projects I have ever worked on.

The series serves as a general overview of the major evolutionary developments that occur over the planet's natural history, spanning several hundred million years. Each 30–50-minute episode focuses on a very broad theme, such as "adaptations to climate", "tropical rainforests", or "islands", and depicts the evolution of over a dozen different clades. Although the format allows only a fairly limited time to be dedicated to each clade, the most important thing for me as the creator is not to go into as much detail as possible, but rather to make sure that everything shown in the episode is logical, easy to understand, and does an adequate job of demonstrating the topic I'm covering. When making an episode, I begin by outlining the topics I want to include and then think about what developments can occur that would best illustrate them. One of the core ideas behind the series was the concept of evolving the biosphere from the very early stages of life (the equivalent of the Cambrian explosion) and show the effects of evolution over an extended geological timeline. Central to that premise were two body plans: the anthostomes and the polypods.

***Magnopteran.*** *After a day spent soaring over the desert in search of food, a large magnopteran stops to drink from an oasis surrounded by a colony of draught-resistant tylophytes. Unbeknownst to the magnopteran, the plants' tiny reproductive barbs have become embedded in the animal's wing membrane, such that the magnopteran will unwittingly carry them to other oases it visits to aid their dispersal. (Image by Biegeltoren)*

**Male Corythobrachid**

*Note the sexually dimorphic features, such as the colored bristols along the eye spots, on the head, and on the front limbs.*

**Female Corythobrachid**

*Compared to males, females have a shorter fur coat and lack distinctive coloration.*

***Corythobrachids.*** *The corythobrachids are some of the most charismatic of all the clades of thylacopod megafauna of the western continent thanks to their prominent sexual dimorphism. During the breeding season, the colorful males attract the comparatively drab females by fluttering the fan-like crests on their arms and cephalothorax. (3D models by Biblaridion)*

***Platydonts.*** *The forests of TIRA 292b are home to a huge variety of tree-dwelling platydonts, from tiny rodent-like grainivores to meter-long predators. Pictured above, a brachiating tanybrachid attacks a suspensory harpactopod. (Image by Isabel Beis)*

**The Anthostomes.** The anthostomes began as sessile, radially symmetrical, barnacle-like filter-feeders with a ring of feathery appendages to sift the water for plankton. While many later clades would retain this passive lifestyle, some species adapted for more active, predatory lifestyles, evolving their limbs into hook-bearing tentacles to ensnare larger prey, and eventually becoming bilaterally symmetrical and motile. It was from this latter stock that the first land animals descended, at first existing as amphibious scavengers feeding on washed-up carcasses along the shoreline, but they were eventually encouraged to adapt for a fully terrestrial existence by the appearance of the first plants

***Thecopods.*** *These small, resilient predators are adapted to thrive in environments where little else can survive like cold deserts, tundra, and barren plateaus. They owe their success to their coat of dense pectinate fur, their ability to hibernate, and their viviparity. (Image by Dragan)*

(actually colonial chemotrophs in a symbiotic relationship with red algae). One early radiation of these terrestrial forms, the tiny, soft-bodied malacoforms, monopolized the niches equivalent to those of insects, worms, and gastropods, and quickly became by far the most numerous animals on the planet, while some of their larger relatives evolved into some of the first browsing herbivores, macropredators, and even flying animals.

**The Polypods.** The other major bodyplan, the polypods, began as segmented worm-like creatures with a series of paddle-like limbs running down their bodies. As they adapted to life on land, their many limbs began to specialize for different functions; some became mouthparts, some became sensory organs, some became reproductive structures, and some were even internalized as part of a breathing mechanism. Once some of these forms made it onto land, they evolved internal skeletons for greater support and more efficient locomotion, and were ultimately better able to deal with the changes in climate and atmosphere than any of the terrestrial anthostomes, and thus were able to supplant them as the planet's dominant megafauna, coming to occupy a similar range of niches to those filled by vertebrates on earth. Some of their notable representatives are the colossal titanopods, bulky herbivores that rely on their vast size to deter attackers, the hypercarnivorous onychodonts, whose front legs have evolved into clawed arms to catch and kill their prey, and the gracile leptopods, fast, nimble grazers that come in a wide range of shapes and sizes and thrive in a variety of habitats.

So far, the series has featured over a hundred clades, with many more planned for the remaining episodes. Once the series reaches its conclusion, I have plans for multiple follow-up series consisting of shorter, more focused videos that each tackle a single, specific topic in much greater detail. Some of these series will continue to flesh out the world of TIRA 292b, while others may explore life on other planets, including those with less earth-like conditions. I never anticipated that the series would become as popular as it has, but as long as people remain interested in it, I will be happy to keep on fleshing it out, and I am eager to see just how far the project ends up going.

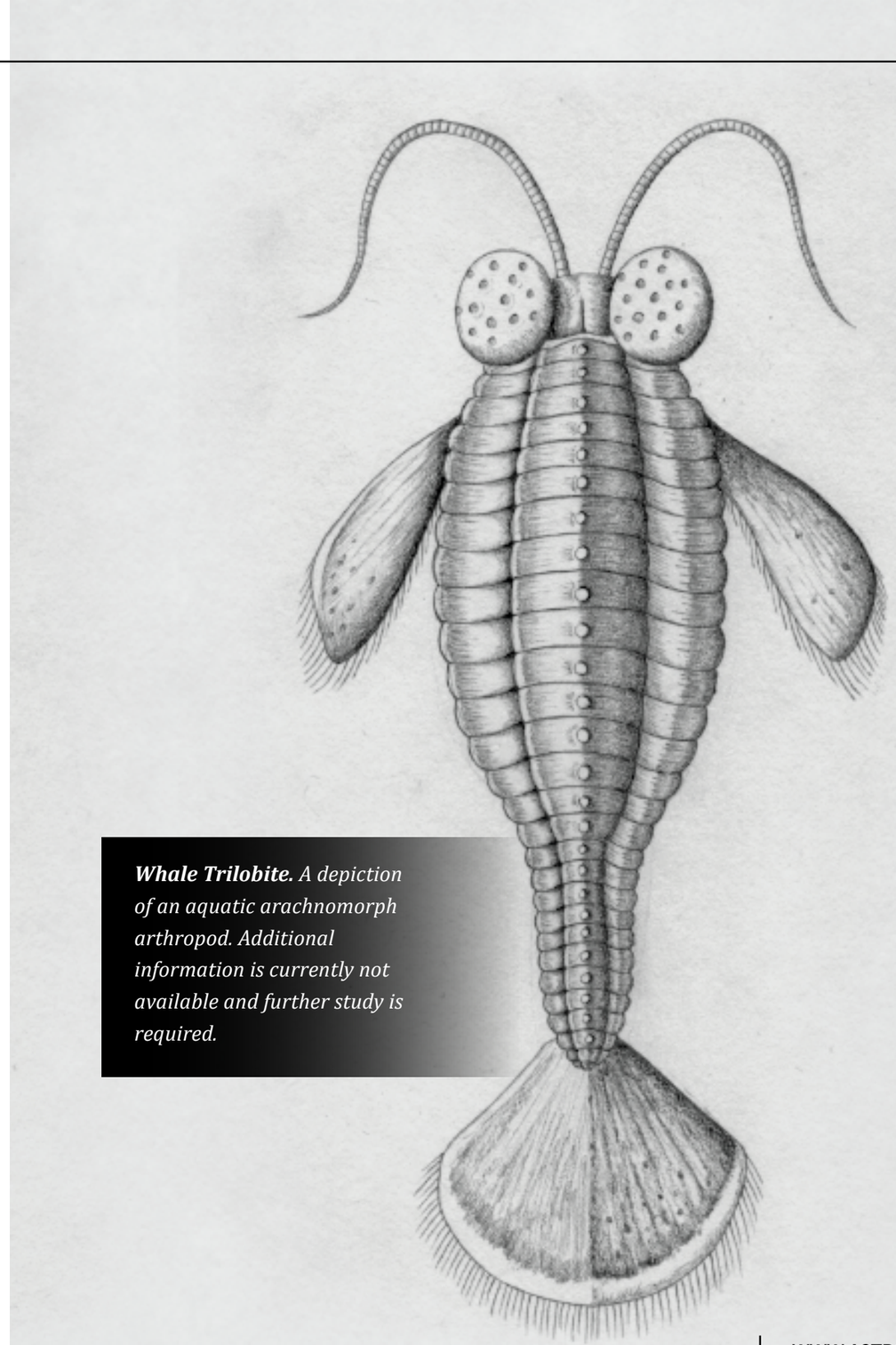
# The Intersection of Accuracy and Theme in Fictional Worldbuilding

> **Truth is a matter of the imagination.**
> – URSULA K LEGUIN

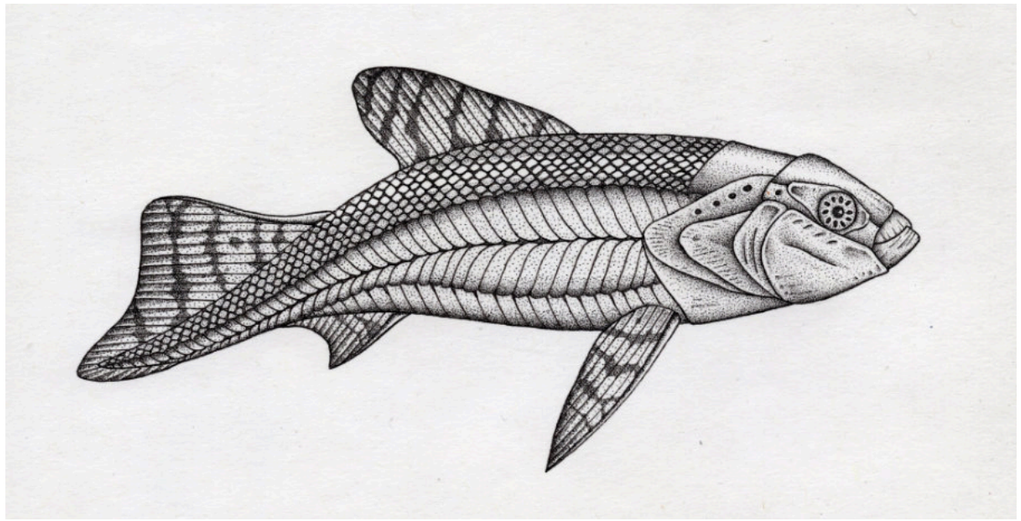
BY REINHARD GUTZAT

When engaged in the process of conjuring up plants and creatures to inhabit fictional worlds, I like to consider how to make this alternate reality believable. Any good work of fiction, whether in the form of visual art, literature, or film, needs to be credible enough to allow its audience to suspend disbelief and accept the premise. Science fiction (and by extension speculative biology) in particular, should be informed with a degree of scientific theory which sets it apart from pure fantasy. Often there is a tendency to criticize works of the genre for lacking a greater standard of realism. I would argue that accuracy is a poor metric by which to ultimately judge the quality of creative projects rooted in fiction. Such criticism often fails to take into account the core intent behind any given work, and can detract from the true spirit of fiction as a vehicle for exploring ideas.

Fiction serves as a metaphoric reflection on our experience of reality, a symbolic representation and a setting,



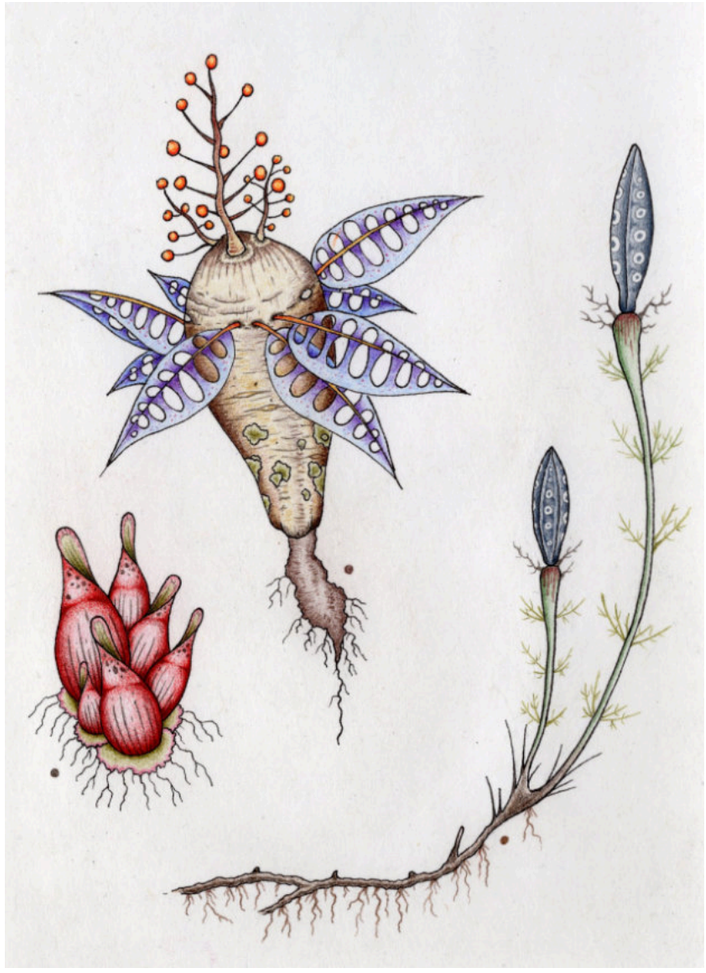
***Whale Trilobite.*** *A depiction of an aquatic arachnomorph arthropod. Additional information is currently not available and further study is required.*



***Falcon Fish.*** *Reminiscent of placoderms from prehistoric Earth and one of several species of armored fish discovered on Vanaheim, the Falcon Fish is a freshwater predator found in rivers and lakes across the planet's largest northern continent. Armed with a beaked jaw made of sharp, bony plates from which it gets its name, the falcon fish is able to shear through the armor plating and scales of smaller fish and some reptiles, as well as the shells of freshwater crustaceans.*

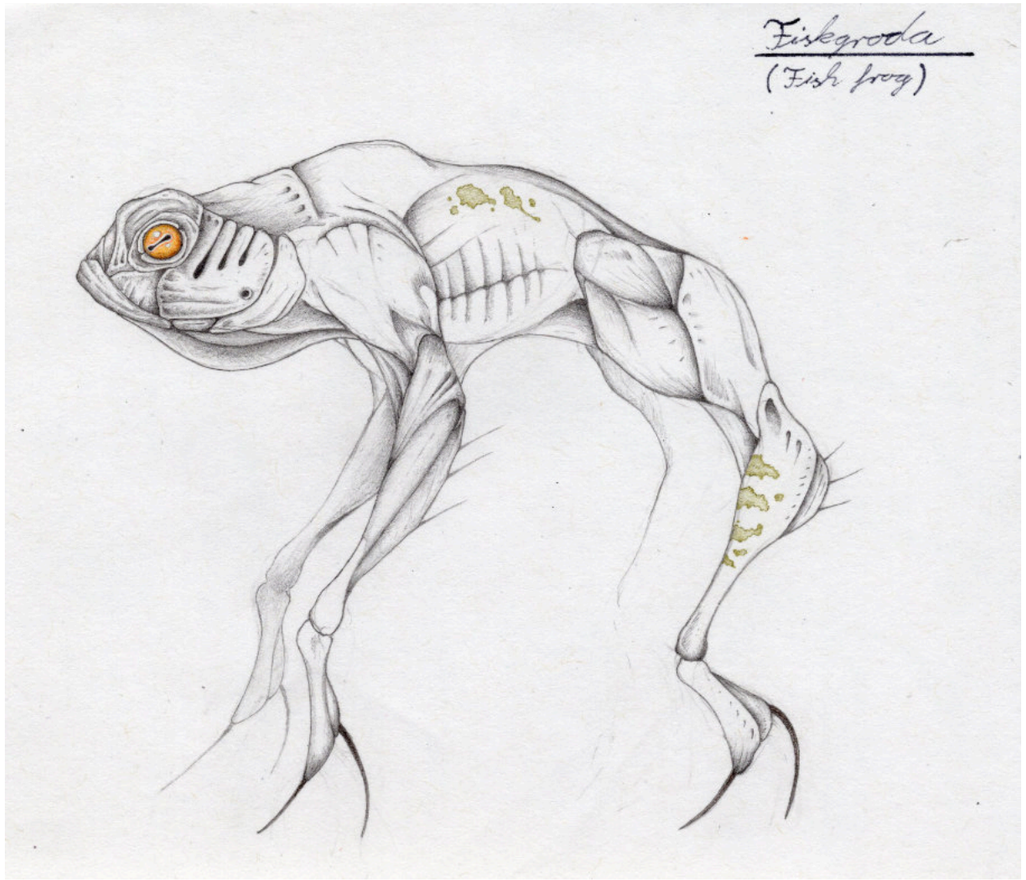
through which to process experiences and examine issues in a new light. It engages our imagination, simultaneously allowing us to indulge in a sense of escapism while also enabling us to think outside ourselves to empathize with others and gain a broader perspective. Good attention to detail and the right measure of realism aid in making a premise convincing and relatable, but fictional worlds exist first and foremost in the realm of the imagination.

Accuracy, then, should be considered in terms of its relevance to a piece, to the themes it conveys in the story it tells, whether as an account of unfolding events or the more abstract suggestion of narrative through imagery or even sound. It should strengthen world-building and support the subject matter. An overemphasis on accuracy for its own sake can end up making a world feel less



***Flora of Vanaheim.*** *Botanical illustrations of a selection of unnamed plants on Vanaheim. Flora inhabiting Vanaheim presents itself in a variety of colors.*

convincing as it attempts to conclusively explain every facet of that world whereas our own perception of reality is subject to the unknown. It is that element of the unknown and the search for truth which drives the scientific method, after all. In the case of speculative evolution specifically, a basis in biological principles is intrinsic to the genre as a whole, but the emphasis nonetheless lies on the speculative aspect. The question of accuracy,




***Friskgroda.*** *Seemingly abundant in freshwater and wetland biomes across much of Vanaheim's largest northern continent, little is currently known about the Fiskgroda. Its curious spine-like claws which appear durable yet flexible, evidently give the animal a literal spring in its step; possibly acting as shock absorbers, similar to the appendages of other fauna of Vanaheim. Based on limited observations, the firskgroda is presumed to be insectivorous, however aspects of its anatomy suggest it would be well suited to active hunting.*

therefore, is itself a matter of speculation. We simply cannot adequately judge the authenticity of something that does not, in the "real" sense, exist, nor can we precisely predict what alien life would look like and to what extent it would affirm or defy our current understanding of biology. Reflecting an ongoing quest for knowledge, our scientific comprehension of the universe is limited and ever-evolving. As such, any re-evaluation in light of new information may at times challenge what we take for established facts. Or as Ronald McDonald from *It's Always Sunny in Philadelphia* puts it, "science is a liar sometimes."

My own preference is to leave some things unexplained, allowing for an air of mystery. This is how I tend to engage with my own work. I like to give some of my creations features which I do not yet understand but which I assume serve some biological function yet to be studied or explained. The sense that there are things left to learn about the organisms I draw keeps me interested and allows for a continued atmosphere of discovery and excitement whereas an exhaustive familiarity with my subject matter might lead me to seek novelty in something new. I feel that embracing the quality of the unknown echoes my sense of wonder at the complexity and vastness of nature, unfathomable in its entirety. The expression of that wonder and its associated mystique is thematically more relevant to my work than strict scientific fidelity.

# A FEATHERED WYVERN

## Creating a Lifelike Dragon

BY SIBILLA PEPI

Animals and drawing have always been passions that have constantly accompanied me throughout my life. Everything about nature has always fascinated me deep down since I can first remember! I have always had this strong urge to illustrate animals just as we see them in the most accurate way possible. All this happened at the age of 5, but looking back on it now even though 17 years have passed, nothing has changed. Over the years I have developed a strong passion for illustrating creatures, imagining what they would look like if they were inhabitants of our planet (or were not). I started to portray organisms in a life-like way, combining the idea of the fictional creatures with the look of the various animal species that inspired me the most. Now I'm working on transforming this great passion of mine into my career. My dream would be to create accurate creatures for the entertainment industry, combining art with popular science.

A perfect example of my process is this little dragon (pictured on Pg. 92 and 93), strongly inspired by a particular species of bird called the *Aethia cristatella* (crested auklet). I became aware of this strange bird in a rather casual way, while I was scrolling on social media and was immediately struck by its extravagant look. At that moment my brain was screaming "DRAGON!" and I could not help but start drawing; caught by the frenzy of my inspiration! Initially I did more in-depth research of the subject, trying to better understand which avian parts I would incorporate into the dragon. I immediately loved the contrast of colors in the bird's livery, beak, and distinct tuft of feathers they have on the upper part of the head. But I was really bewitched by their clever yet almost menacing gaze the most. It was the origin of my feathered wyvern.

After choosing the reference I preferred, I started painting over it to transform the bird into a dragon, eventually incorporating elements from other animals, such as extinct dromaeosaurids (like velociraptor). Feathers would stay on my dragon, as


***Tree Leaper.*** *Tree leapers are fictional animals belonging to the genus Dromaiidae (emus). They typically feast on fruit, insects, small mammals, and reptiles. They use their strong legs to hop from one tree branch to the next and to jump from tree to tree.*


***Fisher Owl.*** *An arctic predator designed for a school project called the fisher owl. These animals are insulated with thick feathers which can repel water and keep its body warm. They hunt at night, dining on fish and any small mammals they can catch.*

this would make it look closer to our common interpretation of what a dragon is. It also gave the creature a small stature (the wyvern is about as big as a turkey), compared to the typically huge dragons in our imagination. I envisioned this little wyvern as a very active creature, living in open spaces, probably rocky and mountainous. They would always look for prey to satiate their hunger, due to its fast metabolism. Wyverns  need to eat an amount equal to its body weight almost everyday. It hunts by jumping on its prey, harpooning it with its sharp claws, and then charring it with a jet of fire caused by two bio-chemical reagents inside the body (which on contact with oxygen become inflamed). The spark that is unleashed inside its mouth can also be thought of as a warning. A strong warm light from its throat radiates in front of the muzzle, creating an intimidating display for the possible enemies or predators who get too close. Its bright colored muzzle also has the purpose of sexual display, as the females will be more predisposed to mate with the specimens with the brightest colors and most imposing crest.

The illustration of the wyvernn depicts the moment just after the hunt, where the wyvern has found a rock to enjoy its much deserved rest and will spend the following hours digesting its meal. On the right, I add a focus on one of its medium sized feathers, with its respective size, which helps us to better understand the size of the animal itself.

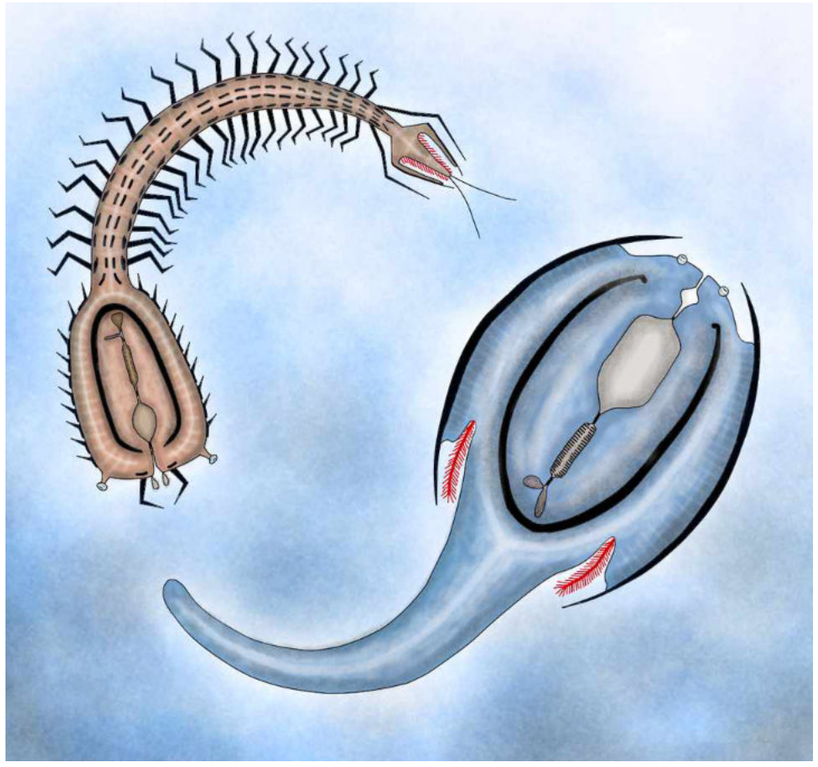
This is but one of several designed creatures inspired by an animal from the natural world which constantly continues to fascinate and inspire me every day.


***Feathered Wyvern.*** *Final image of the feathered wyvern inspired by a crested auklet and dromaeosaurids.*

# CREATURE

# COMPENDIUM

***Male Slugbird.*** *(Image by M. Moudry aka Webvein)*



## MYRIARTHRAN & DIPLOVALVE

**By Omnipotent Space Bagel** (Creator of PLANICA: Life in 2D)

Some organisms are braver than others, regardless of the size of their opponent. In this instance, a relatively feisty Myriarthran aggressively inspects a slightly larger Diplovalve, who is desperately attempting to escape the many-legged attacker. The Diplovalve is accustomed to consuming far smaller, planktonic Polyarthrans via suction, lacking any hard structures at the jaw. The Myriarthran, on the other hand, is adorned with a pair of serrated mandibles ancestral to its lineage, with which it can use to bite off chunks of flesh from the Diplovalve's exposed tail. The Diplovalve has no other means of defense besides its shell, and so can do nothing but swim hurriedly away. Perhaps its pursuer will grow tired, or perhaps it will lose interest and pursue a new prey item; or perhaps this is the end.

## PLUMA CAELO COMEDENTI

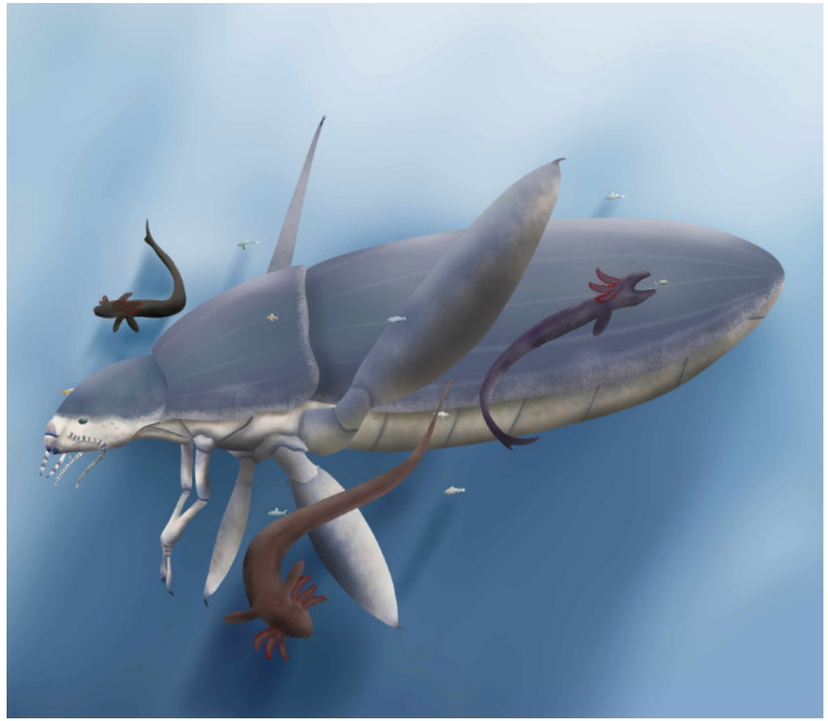
**By Luna** (Foppop21)

The skies of the gas dwarf Cyano-Ventus are inhabited by *Pluma Caelo Comedenti*. These exotic organisms spend their entire lives floating in the planet's stratosphere, where they stay aloft using a balloon-like organ, filled with hydrogen. This allows them to float, high above the planet's surface, where they would be crushed into diamonds. They obtain their energy from hydrogen sulfide in the atmosphere, processing it in their "feathers" which they cyclically grow and shed, in order to minimize sulfur residue.


## PHYLLOPTERYX HIPPOCAMPUS

**By Imagined_beasts**

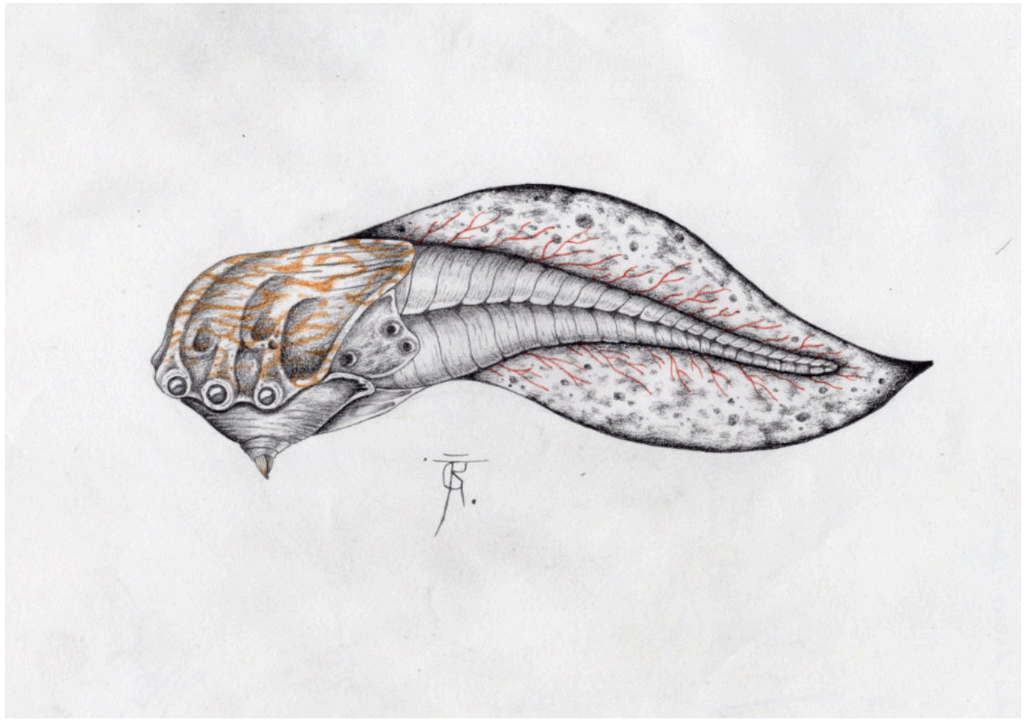
Hippocampi are the ‘water horses’ of Greek myth. Large, aquatic and two-hoofed, they were said to pull Poseidon’s chariot. When I managed to find one, in the shallow seas of the Aegean, I was impressed by its size: it is significantly larger than other species of Seahorse and Sea Dragon, to which the Hippocampus seems closely related. Despite this, the idea of this Beast pulling a chariot through the ocean is absurd, especially if Poseidon was in a hurry. It is a poor swimmer, relying on a weak dorsal fin to propel itself slowly and clumsily through the water. Due to such general immobility, the Beast spends most of its lifespan clamped in one place, filtering nutrients from the passing currents. Unlike a Seahorse, it lacks a prehensile tail with which to anchor itself, and instead uses ‘hooves’ to hook itself over rocks. These hooves are at the end of bony, inflexible structures, formed in the same way as a Seahorse’s spines, and so cannot be used for locomotion — but they do resemble equine forelimbs. These 'hooves', along with the mane of seaweed-like lobes on the Creature's neck, make comparisons to Horses easy to understand.



## GREAT DIVING BEETLE

**By Hope C. Dixon**

The great diving beetle is a type of megarthropod from the semi-alternate Earth world setting called Einea. Even with the advantage of Einea's higher oxygen and 25% lower gravity, arthropods needed some adaptations to reach such immense sizes, including an active respiratory system and internal calcification to make body supportive pseudo-bones. This diving beetle, a pursuit predator in the manner of an orca, evolved from that first rabbit-sized ancestor and took to the sea. Notable also in this image are the juvenile great diving efts, oceanic salamanders that are active and toothed in their youth before losing their teeth and gills in adulthood to transition into a filter feeder lifestyle.



## BEAKED FUNGOLOPOD TADPOLE

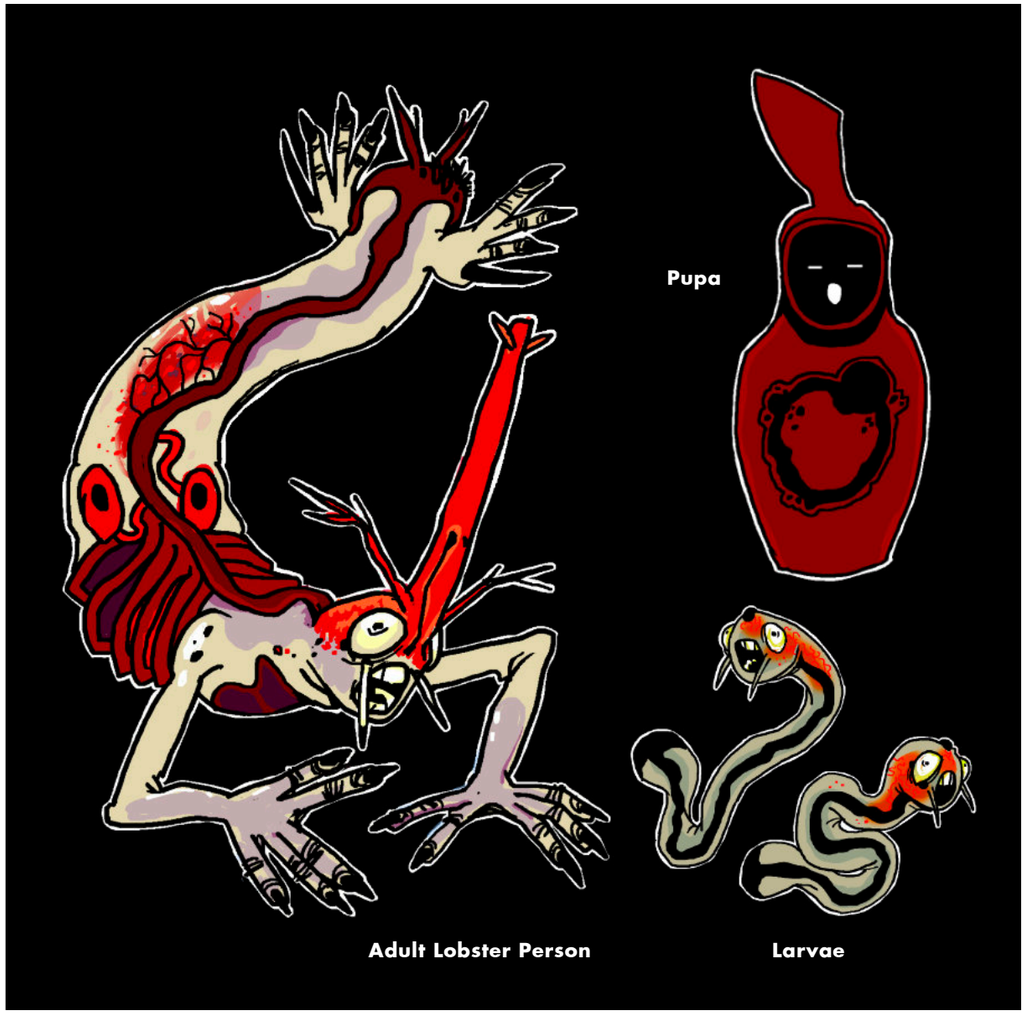
**By Reinhard Gutzat**

Not quite the traditional tadpole of an amphibian we are familiar with, the larval stage in the metamorphic life cycle of the Beaked Fungolopod nonetheless serves a similar function. The cycle begins when sporopods are dispersed in tidal pools, where they quickly germinate in the water and grow into tadpoles, developing ocelli, gills, a fin-like swimming tail, and their characteristic beak. They remain in larval form for several weeks, gathering food and storing nutrients in their tail before growing rudimentary legs and leaving their aquatic environs to complete the transformation into adults on land. It is unknown why this species prefers the saltwater of tidal pools to freshwater environments for the initial stages of metamorphosis.

## LOBSTER PEOPLE

**By Michal Sadowski (Ycyprid)**

Lobster people inhabit the warm seas of Planet Cyprid, hunting in the shallow reefs and lagoons looking for prey under rocks and crevices. They lay hundreds of eggs in secluded lagoons that nurture their larvae. When larvae reach their maximum size they crawl out from the water and bury themselves into sandy substrate where they pupate.



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Special thanks to Oliver Gries-Hoffman for assisting with editing again! Your help is always appreciated!

And thank you all for your lovely submissions!

***Planus Chasma.*** *A landscape of the Planus Chasma region located on the planet Menir. (Illustration by Christian Cline)*