

# PREHISTORIA

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## THE RAPTOR'S TAIL



by **JACK BLACKBURN**

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# Acknowledgements

This small labor of love wouldn't have happened without the stable and loving environment my family brought me up in. Always encouraging me to increase my knowledge and use my talents. If the saying goes "It takes a village to raise a child", I'd say my village started with great parents and an awesome elder sister. All else was a domino effect from there. A lot of my basis in writing came from the media, fiction and nonfiction, I was exposed to growing up and continue to be. Fans of certain Westerns, Science Fiction, and Thrillers I enjoyed through my family might recognize certain motifs and tropes in the following story.

My friends and girlfriend, one of the illustrators, have also been a constant source of encouragement and ideas for the following tale. Several key ideas, inspirations, and subject matter were directly inspired by the ever-creative and beloved Cheyenne Grier's input. The artwork featured in the story was the direct handiwork of herself and the talented paleoartist, Sumair Ferhan Syed (known online by his Twitter handle "[Riamus01](#)"), who also helped design the creatures featured. The final piece of artwork featured in the story was also directly inspired by a work by another friend known online as FallenAngel5414.

Two more close friends of mine, both talented authors, really were what helped me finally get the ball rolling to pen this tale. Highly recommend the upcoming *Fossil Guardians* adventure series made by Joseph Jeffo II; and Vincent Yam's fantasy series, *A Fractured Song* for some excellent reading. Without them, I'd never have had the chance to hopefully entertain you. All of these creative folks gave invaluable insight into writing and structuring this tale. My many friends online from Discord to *GojiCenter* also pitched in help in their own ways which I'll be always grateful for.

And because the following book is meant to hopefully educate as well as entertain, I have nothing but thanks to my employment at the *Museum of Dinosaurs and Ancient Cultures*. Years working with the public there helped to teach me a lot about both presenting the past to an audience, but also how to hopefully keep the audience engaged whilst they were learning.

Nothing is totally new and I'm unashamed to tilt the hat to sources I drew from. The principle idea for using a prehistoric setting to showcase speculative behavior through the lens of following an individual animal going about its life came from the 2003 series, *Dinosaur Planet*. The numerous Impossible Pictures and BBC produced series such as *Prehistoric Park* and the *Walking With* trilogy of life also factored, which did a great job showcasing how entertainment can be used as an avenue for education.

Last but not least, all of the knowledge I drew upon to pen this piece came from hundreds of hours of hard work and dedication by various Paleontologists and Paleoartists around the world and across decades. What I set out to pen was an entertaining interpretation of the past. Perhaps something that happened across the sea of time, perhaps not; but always grounded within the fantastic ancient world their hard work has allowed a glimpse into.

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**PREHISTORIA: The Raptor's Tail**

(Prehistoria Book 1)

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# Prologue

She'd been jarred awake by the smell. Remaining perched on the tree limb, eyes snapping open into the warm night's dark veil as her clawed hands and feet gripped the bark.

Hot, rancid breath billowed past her face, the metallic scent of blood clogging her nose when she'd sucked in air on reflex. Vision, still blurry from being jarred awake, caught only a glimpse of movement before a wet thunk snapped down beside her. Something was pressing onto her wing.

Her eyes snapped open as the world briefly froze. Her wing feathers were stuck between the ivories forming a serrated row of fangs. A maw belonging to a predator who'd crept up so silently during her sleep was locked down upon her arm. A matching set of quilled plumes frantically flapped into the air on her free arm. It was only by mere centimeters did the parting jaws not slap shut on her arm itself after having bitten down on her wing feathers.

They'd never seen their attackers coming. The enemy had crept up upon their typical refuge in the treetops in their sleep. Reaching into the canopy to pluck them from the branch as a cat might a bird.

Her clawed feet pounded on the tree branch in a backpedal, trying to run away foot over foot. Until she ran out of branch to stand on and her attacker, wing caught in its mouth, wrenched aside in the opposite direction. Skin pulled and tore, blood droplets flying in front of her quivering eyes as her wing feathers were ripped out with some skin going with them.

The vertigo from the fall several meters out of a tree left her mind in a daze and flashing stars in her eyes that matched the number in the night sky's tapestry. Memory caught still images more than it did full recollections as the milliseconds ticked by.

Three sets of yellow eyeshine standing two meters off the ground. A trio of giants with horned brows and spiny snouts. A sharp clawed, winged corpse very much like herself limply hung from a set of long jaws with

blood dribbling down the dead face. Another of the predators was advancing. Taloned toes striding forward. A parting span of jaws, her own wing plumes still stuck in its fangs.

Blood on the ground. Drool ran off dividing jaws like those that had taken the life of her wing and mate. Rumbling falls of scaly, three-toed feet closing in across the forest floor.

Her mind comprehended only one word. Now was not the time for sentiments.

*Run.*

Foliage and understory smashed and raked over her tiring body, scrapping hide and fleecing feathers free. The footfalls kept coming and a glance backwards offered sight of those twin amber orbs hovering over the ground, borne behind a set of long jaws topped in with a spiny snout.

Time blurred with moments feeling like hours. Frantic dodges through a blurry viridian and weaving around fallen trees. Foot over foot, trying not to collide with a tree trunk nor be caught up by the hunter.

Step by step, pant by pant, through the scattered silvery moonbeams and undergrowth. The scenery changed. From leafy and branched claws of foliage raking against her form shifting as the forest opened up. Through the illuminated curtain of star light, stalks and trees had given way to sun bleached bone and tarry old sinew. A pungent odor of death was about, her footfalls patterning scraped vertebrae and exposed ribs of a carcass from some giant beast which lay dead in the clearing.

Dry thuds of footfalls pounded the ground behind her still in the breakneck chase. Hot breath was still billowing over her neck. They were taller, larger, and swifter on open ground. Her only escape was to get where they couldn't follow, and the treeline was too far away.

She jumped from the opened chest of the carcass and made a break across the glade. They were gaining, and she'd never reach the treeline. Instead as her frantic eye looked about for safety, they keened upon a thatch and wood heap several meters away. A pile of branches and torn-off tree limbs, forming a sort of fortification from a like-form she recognized from her youth, the opening to a hollow within beckoning her.

Sprinting for salvation, foot over foot, with her remaining wings flapping to try and afford any minor boost. Somehow through the panic, a low rumbling was loosed from her throat; a resonating boom that carried through the night air.

The horned nightmare was upon her, curtains parting with the span of long jaws with serrated knives that still bore ragged and torn feathers between them. The glade had come alive with their movement and everything was in motion now. Above the fortress of broken branches, flashes of twin green spots and eyeshine emerged.

There was a deep sound like rolling thunder, a living storm seemingly ascending to the skyline as the source of the roar stood up higher and higher still.

# Chapter 1 - Morning

Four months later, the slow breezes of the coming dawn ebbed and flowed with the changing landscape. The heat of the sun and the cooling brought about by the flowing rivers caused an oscillation of temperatures, crisp cool and wrapping heats, feeding the rich viridian Eden of forests and marshes with the cusps of the gentlest winds.

70 million years ago, in what will one day be the deserts and plains of Mongolia, life existed in a verdant brilliance.

Amongst the leaf litter and low-lying ferns of the understory, a small brown form scampered through the foliage; kicking up loose leaves as it did. Dawn had come for this small beast, and with the light casting aside darkness and its protective cloak, so too came the dawn's dangers. Colored a mottled brown hue across the body with a pale strap crossing the back, in shape it might vaguely recall the appearance of a shrew or marmot; but the peculiar beast had no modern counterpart.

As the critter scampered across the forest floor, leaving a trailing cloud of loose leaf litter in its wake, something else beat the ground behind it. A shadow loomed over the small mammal and spurred it to pause its retreat. The critter's lack of relation to any living form an onlooker of the modern age might know was quickly betrayed as it turned to face the shadow with jaws agape. The front teeth were pointed and tusk-like, but in place of the molars there was a singular, buzzsaw like whirl of a blade.

The furry creature which so resembled a rodent, but wasn't lunged and snapped, threatening to nip and bite at the object of its fear. All whilst chittering constantly. The shadow backed away briefly, and that was deemed enough of the brief respite as to be acceptable for the diminutive mammal.

The *Buginbaatar*, a peculiar name meaning "Hero from Bungin Cav" for the region its fossils would one day be found in, turned tail and scampered for the trees. Clutching the bark with all four feet, the small beast scampered and shimmied its way up to get clear of the forest floor. Night or day, but especially the former, being on the ground typically

could mean death for it and those furry beings like itself. Being in the trees or within burrows often meant safety. It was little wonder why most mammals of this bygone age were optimized to partake in both the treetops and underground with their generalized forms.

However, security was not so assured in conditions like these with this company. Having recovered from the momentary backpedal so as not to get nipped, the predator shifted focus and instead sprinted for the tree itself. Scaly feet bearing long claws beat the ground back and forth to propel them forward, kicking up loose litter in each stride across the understory draped in sunbeams. Muscular legs coiled back and sprang off the ground on impact, launching their bearer airborne.

The arms and tail took the reins in movement, gliding thanks to expanses of broad feathery plumes upon both arms catching the air in a controlled fall. The hunter was a rusty hue overall on the body, coated in feathers on a majority of its body save the feet and muzzle. The long tail swayed through the air, acting as a rudder to assist in steering during the short glide. Down the length of the extremity, the plumage's coloration continued to be red across the midline but there was a shift towards the end. On each side, about two-thirds down the length, the long and broad feathers bore a wide, green circle with a black dot in the middle. In shape these could be taken to be the image of a pair of large eyes.

The hunter's arms were held spread. Shorter than the legs, much of their span was widened by long plumes composing a wing that extended from the upper arm, down the underside of the limb, and to the middle finger of each tri-digitated hand. The plumes of the wings, wide and long, were a similar color to the rusty body, but shown brightly as the sun glowed through them in the brightness of the morning. Amidst the energetic flapping of the wings, which were too small for true flight but enough to boost the jump, the three blackened talons tipping each finger were flashed.

The body was paler on the belly than the back, with gray, scaly skin visible on the feet. Gliding closer to the tree, the legs were turned about and brought to bear. A hooked, sickle-shaped talon was prominent on the foot's innermost toe that swiveled forward; far larger than the two other primary digits. It was these talons that made first contact with the tree as they stabbed into the tree bark, biting and holding fast with a stride. The

hooks anchored in, the muscular legs bulging with intensity of effort. Beating its short wings for extra lift and balance, the predator promptly resumed the chase by virtually running up the tree trunk, foot over foot. Sprinting up the trunk amongst its flapping, they quickly began outpacing their quarry.

Lips parted and recurved and serrated ivories were exposed when the head snapped down. Within the flash of a moment, they promptly carried the quarry's life to its conclusion. Tooth snagged on flesh to the bone and a snap of the snout elicited a sharper one in the prey's cracked neck. The mammalian form went slack with death, before being thrown back and engulfed down the parted gullet whole.

A short time later, cast in the glow of the morning sun that showed through her feathers, the feathered huntress hopped back down from a tree branch she'd perched upon after scarfing down the morsel. Blood trickled across the seam of scaly lips, present on the latter half of the muzzle where one would otherwise expect the avian looking beast to have a beak instead of its toothy snout. Resembling something of a hawk with elongated legs and a tail, the hunter, or rather huntress, descended back to the ground in a slowed jump with her wings parachuting her fall.

Even for a small dinosaur not much larger than a typical wolf, the few pounds of flesh would hardly suffice the churning in her gut. She hadn't eaten otherwise in the last day or so. But alas, the *Adasaurus* couldn't afford to continue her prowl any longer. To the crimson avian saurian, Ruby, she'd been gone for an hour and that was quite possibly an hour too long.

Stepping across the forest floor, Ruby followed the game trail cut into the dirt to set about the journey home through the forest understory. Low to the ground, she easily slipped into the reddish undergrowth of fallen leaves and shrubs to mask her sprinting flight through the woods.

A close relative of *Velociraptor* and double the size, *Adasaurus* was so named after an evil spirit of Mongolian myth. But, contrary to the demonic title and blood still on her maw, Ruby was no vile monster or needless butcher. In fact, to the lives within her destination, to the family she'd been hunting to sustain herself for, she was life itself.

The journey was short to return home, which was a small clearing within the trees that formed a glade. The nest she sought was huge in size, almost like a small hill made of foliage. A pile of sticks, branches, and leaves two meters high and double that span across. Its small opening on the side, covered atop and shaded by a swath of thick branches that likely constituted several whole saplings forming a roof. It and the hollow chamber within beckoned her towards the interior.

But, the huntress paused, staying in the shadows with only a few beams of light dappling from the canopy across her feathers. The air was still, the wind having died off. That meant no breezes to carry scents, just what had been present. A pungent stench of rot, of strength so thick it could only have come from something enormous and predatory, hung in the air. Her little nostrils dilated and constricted slightly with every puff of air taken in.

Memories of a particular night from months ago returned, as did the phantom sensations of pain in her arm. The stems and pins of her regrown feathers ached from where their predecessors in her old wing had been violently torn out. The *Adasaurus* swung her head too and fro to check her surroundings and didn't step into the revealing light. Chest panting with breaths as if pumping herself up like a balloon, she straightened up and kicked several clumps of dirt and leaf litter behind her before closing her mouth tightly.

The feathers across her neck and chest shuddered and vibrated slightly, the skin beneath rattling with reverberating air. The very low rumble Ruby let out wouldn't be audible to most animals and was surprisingly deep for a beast of her size, but it carried a long distance. And given she was alone whilst wanting to check where her company she'd called out to had gone, the raptor wanted to see if anyone was about as carefully as she could. The *Adasaurus* paused and waited for a response, tilting her head and looking about whilst keeping an open ear.

The silent forest only rustled under returning rivers of wind slithering between the trees, offering no signal of anyone friendly. Fear wanted to keep her feet planted in the shelter of the canopy, but instinct beckoned her forward. High above the raptor's head, numerous branches were broken and snapped, like something big had pushed through the canopy and shattered whole tree limbs in its movements.

Deciding not to wait any longer, Ruby hopped forward and scampered into the glade to reach the nest in a dash. As she moved, her feet momentarily crossed a dip of an impression in the hard-packed dirt. Climbing a full meter to reach the mouth of the sheltered nest, she only paused to turn around and recheck her surroundings before walking backwards into the cover; feeling a sense of security in the shadowed darkness that hid her. The shield from past nightmares was enhanced by the scent markings left upon some of the branches, a half dried, black tarry gel that stained several timbers ringing the entrance. The pungent odor from the scent markings was comforting, despite the strength. By sight, smell, and cover; she was no longer where she was several months ago.

Home and safe, Ruby turned about and lowered herself down, extra careful where she stepped and how she nestled in. The soft feathers across her belly extended out, exposing the heated skin of her stomach and chest to the four oblong eggs soon nestled up to her. Each was nearly half as long as the width of her hips to torso, speckled with black against the dull blue span. The raptor was keen to wrap her feathery wings around the quartet of eggs to distribute the heat and embrace her family with a mother's love.

Ruby felt her body relax and muscles unwind. She spent at least half an hour prodding and turning over her eggs with the gentleness of a lamb, making sure each and every one was tended to. Sometimes, low cooing would emanate from her chest at the touch of her snout to them.

Whispers of a lullaby to her growing family. It worked to calm her own pulse as well, slowly ebbing her eyelids to rest. With how much energy she had been splitting between heating the nest and fasting from all but the briefest of hunts, sleep soon took her.

Life had changed much in these past few months, from that ambush in the night that took her mate. Content in safety for now, she could rest.

Across the glade, one could see where the dutiful feathered guardian's trackway intersected the impression from before. A set of leaves, blown by the breeze, fell within and rolled around across the weight-impacted earth. When viewed from above, the impression would reveal itself as an enormous, three-toed print tipped in broad claws. The track carried the pungent odor that often meant death to so many beasts.

## Chapter 2 - High Noon

It was a few hours later when Ruby's eyes snapped back open, having been partially resting to conserve energy from the gnawing in her mostly vacant belly. Her neck extended from the bunched-up feathery plumes on her collar, enough to poke up and cast her line of sight through the portal entrance of the nest. Across the glade, the light was now much stronger due to the sun being at the height of noon. In the sunbeams, a shape was visible through the trees and foliage rimming the glade. The unknown slowly began to emerge from the groves and into clear visibility.

Nostrils sucked in air at the treeline, the shadowy figure stepping into a beam of illumination. Two-toed feet with a recurved, sickle of a talon on the inner toe, stepped into and perfectly fit the tracks Ruby had left, which the owner of said feet had been sniffing. Checking the surroundings just like the nest owner had by looking about, another *Adasaurus* revealed themselves into the noon sun. It was another young female raptor of near identical appearance, if perhaps slightly older than Ruby herself as gauged by her moderately taller frame. She stepped into view without emitting the low rumbling utterance Ruby had done. Without fear, she paced towards the nest in total heedlessness to aversion or caution, following Ruby's tracks.

Ruby watched her approach, eyes dilating with swells of black pupils overgrowing their span as she registered what was coming. Another of her own kind. The first she'd seen in a while. Ruby's mind registered these facts and instantly a switch was thrown. Some species of raptors were social at times. When a target of opportunity arose and a mob of sharp-clawed predators could band together to bring it down, or when a mated pair set out to start a family together. A few species, those that towered over the largest of Ruby's kind, even lived in packs which hunted and raised their next generation together. The social raptors welcomed company like themselves.

*Adasaurus* was not one of them.

Ruby sprang up, climbed off the blue eggs, and jumped into the opening of the nest. Her plumed hackles were raised and all her feathers were

bristling off her body to try and look twice her size. All as she snapped her jaws in the air and hissed in a manner that exposed all of her teeth as was possible. Another *Adasaurus*, the same sex or not, was arguably even worse of a danger to her future than most carnivores of a different type. Not just a competitor for sustenance, but of home, of nests and what lay in them. This intruder was a threat to her eggs unlike any other. The potential future of smashed and cannibalized eggs to clear the path for her own brood was a message carried by instinct to Ruby's mind. Far from a packmate, this was nothing but a rival.

Said rival stepped back, perhaps surprised to be confronted so brazenly, but Ruby offered no chance to regain that advance. Hopping up to put her feet at the entrance to the nest, Ruby hissed as she bounded down the height of it. She jumped across torn-down and snapped branches, some still pale with splintered woody gut as thick as she was; before spreading her wingspan to glide down to the glade floor.

Landing, Ruby fanned her wings and lowered down ready to pounce, still swaying her tail's fan of feathers back and forth in clear agitation. The green eyespots on her tail feathers cast a visage all to themselves, one the rival copied with her own identical display. Wings with a turn of the wrist and fingers as with tails erect, the two stood apart at high noon; tooth and claw ready to be drawn at a moment's notice.

Between the patterns on their tail fans sporting those green eyespots, and the darkened line trailing down the tail and dorsum to look like the brow and snout, the small plumed predators visually transformed their whole bodies into the image of a much larger carnivore's face.



**High Noon Confrontation**  
*Adasaurus* by Sumair Ferhan Syed

Maws open, drool from their lips running past bared teeth, both raptors loosed raspy hisses at one another. In the brightness of the sun, with both exposed to its heat and to any potential threats that might be watching, it was as if either was daring the other to quick draw or back-off first.

The showdown continued for a minute's span, eyes locked upon one another and talons raised in anticipation that could be felt across every tensed muscle.

Motion promptly exploded from the two, Ruby taking the initiative and acting on her greater incentive to win this confrontation to charge first. Her feet beat across the glade's open ground, digging her claws in for better purchase before she sprang forwards in a kick-off from the dirt. The rival was forced to backpedal when the nest site's owner pounced, swinging her sickle shaped foot claws forth as her jaws snapped.

Amidst wing flapping and snapping of jaws upon landing where the rival had been, Ruby kicked up again with her powerful legs lashing out like a set of springs. In a flurry of movement, hissing maws and snapping plumage, the other *Adasaurus* met her attack and a melee both chaotic and calculated ensued. It was a surreal display, with the two females lashing and snapping at one another in a frenzy so fast one could barely see it; only to land and return to their displaying stances a moment later.

Like clockwork it continued. A frantic lashing of claws and kicking feet, occasionally even locking talons or punting another's claw away midair in their frenzy of movement. Then, as soon as they'd hit terra firma, they'd quickly resume their display stance to bear down their intimidating visage upon their rival. Poise in their posture and display was almost as important as actually landing a hit on one another, especially with multiple feathers flying and falling loose upon the glade floor. By maintaining their poise and landing a hit upon their foe, either of them might win. By damaging their display or being struck down, either of them might lose.

Back and forth, across the glade in a melee that kicked up sand and dirt with each motion. Ruby would lunge and lash out with her winged arms, trying to grab and cut at her rival's chest. Amidst the rapid-observations the *Adasaurus* was making every fraction of a second, she'd have to react just as fast. She ducked aside to avoid her rival's neck and maw whipping out and snapping audibly in the air, serrated teeth just barely missing her throat. The attempted bite continued to surge forth and aimed for her wing, either to bite her arm or go for her plumed feathers.

Ruby's dilated eyes flickered with a momentary flash of memory, not out of emotion but recollection. Of her falling out of a tree and witnessing a yellow-eyed hunter who'd torn her last set of feathers out trying to take her life, as its cohort had her mate's. A sharp toothed predator lunging for

her wing was something she'd experienced before, and instinct from then reacted in the now from it.

She sprang backwards and spread her wings, intact and broad unlike the night that took her mate. She was a lot more maneuverable now than she was then. A flap of her arms and holding them and her tail fan spread were sufficient to catch the air in her span and make use of it.

Reorienting in mid-air to turn herself about most uncanny for most creatures, Ruby glided and practically surfed on the air flow. Turned about just as the intruding *Adasaurus* sprinted after her, Ruby's eye tracked her rival's movements. The perception of time seemed to slow and she watched. Her arms spread as she glided forward in a swooping arc with the other *Adasaurus* running alongside several paces.

The impact of each scaly foot across the dusty and leaf litter laden ground. The subtle sway in her feathers from the rushing air. Eye to eye, pupils dilated with claws and teeth bared in what might be one of the most important conflicts in either's life. Flapping her wings once more, Ruby redirected her leap and spun about abruptly. Her left leg touched the ground, toes digging in and bracing just as her rival sprang at her.

Ruby's right leg cocked back and swung up, impacting her rival's chest. In the same motion, she snapped her neck and jaws out to bite down upon the other dinosaur, before her coiled-like-a-spring leg shot out to its full extent whilst still braced on the rival's sternum. Springboarding off her rival's chest just as their jaws lunged for her shoulder and clamped shut; both raptors launched apart from one another. Both had their entire momentum abruptly changed. Ruby stumbled over on her left foot and had to hop backwards with her still very intact-wings parachuting her fall as her rival went recoiling in the opposite direction.

It had been a mere twenty seconds after the fight started, a seeming eternity of combat despite being the span of a held breath, when the pair finally remained separated. Ruby pulled back to her footing and resumed her threat display posture. Her body palpated and shrank in panting breaths and her typically immaculate balance almost faltered. Aside from a small bare patch on her shoulder where the feathered plumes had been torn free, she was almost entirely unmarked. Instead, a wad of feathers and skin was caught in her front teeth, with a small trickle of red ichors dripping from the tip of her snout.

Her rival didn't land on their feet, flopping onto her side amidst an uproar of dust and dirt on her feathers. Visible in the noontime sunlight, her coat was further blemished with a bare patch across her collar where she'd been bitten into. The wound wasn't deep and surely wasn't mortal given the other scars on her legs and snout signifying this was hardly her first scuffle, but first blood had gone to the homestead.

The rival's eyes met Ruby's as the latter resumed her crouched display, the green eyespots on her tail cast in the high noon sun as if a war banner. Ruby's throat rattled out a breathy hiss over her raised tongue, carrying a clear intent to her own kind. Lips curled to reveal smoothly recurved and serrated teeth, sickle-claws raised in tandem to bolster the threat and posturing.

The homestead *Adasaurus* stood tall, and was clearly in full condition to continue this with how much she had to lose.

And either due to scoring the first actual hit or her bravado, the homestead's defense won out over experience. The older drifter had herself and her health to lose, a prospect not in equal balance with such vigor behind Ruby's offense. The rival female didn't cast her display again, instead keeping her tail lowered and feathers tucked tightly together.

The drifter clicked her teeth together quietly, as if acknowledging her superior. No longer a threat, she marched off into the forest without a limp or blood trail. The fight with serious consequences hadn't been serious in itself, so it was better to live to see another day than risk more.

Ruby watched her go, catching her breath in the meantime. There wasn't a sense of victory in her mind, such concepts were lost within most of the animal world. Just a degree of calm. The showdown concluded, she promptly ignored the hunger in her gullet and returned to the nest. Her duty and reason for fighting so ferociously beckoned her back. Curling up atop the eggs, she resumed her arduous sentry posting.

## CHAPTER 3 - EVENING

It was a few hours later that Ruby awakened, having rested to recover her strength quicker from the confrontation earlier and stave off the gnawing hunger festering in the gut. The small morsel from earlier wouldn't be enough to sate her for too much longer, but with it being the middle of the day she didn't dare go out hunting for a lengthy time. Especially not when the guttural rumbling outside had jarred the *Adasaurus* from her light sleep.

Ruby poked her head up from the shaded entrance and near-instantly poked her head back inside the moment she glimpsed a shadow pass over the front of the nest. At first she thought them something else, mind identifying several varieties of enormous beasts she'd known by experience and instinct, but the large newcomer's identity was swiftly confirmed to be otherwise. Enormous, broad, four-toed feet shifted position at the base of a tree across the glade, and the stench of rot wasn't with this one to indicate a predator. The canopy was also moving, the large form shaking and pulling at a set of branches over six meters off the ground.

A very large dinosaur, magnitudes larger than Ruby herself, was moving about in the thick growth but obscured by the dense vegetation. Directly behind the stout trunk of an evergreen, it lowered its arm briefly and claws were flashed. Each talon was the size and shape of scythe blades, easily longer than the raptor was tall. They briefly dragged across the trunk; prying off bark that cascaded down their length as it went. Ever so often, its large mass would cause one or two branches to snap due to plowing through the trees, slowly drizzling the understory with the soft verdant leaves of the canopy.

She tensed, hackles fluttering and sickle claws raised as hunger once again festered. Ruby was a huntress, and she hungered. Cold times had come and would come again, and her body was burning more energy

than it usually was. A sniff of the air confirmed to her what this intruder was, and dinner was served if she was quick enough.

A reddish blur crossed the clearing, the *Adasaurus* sprinting the span of the glade as fast as she could. Another branch had fallen, and focus wouldn't be on her. Ruby's powerful legs coiled and launched, springing the predator into the air with the breadth of her wings catching the flowing currents to enable a gliding, controlled fall of a pounce. Aimed true, her sickle claws lunged forward as she barreled at the leg of the intruder.

Her talons were smaller than some other species of raptor, but they served their purpose sufficiently when they swished downwards like guillotines, impaling flesh and ripping through muscle with ease. The large lizard, somewhat resembling a tegu or iguana, having been basking in the trees to warm itself when it was suddenly dropped from its perch by the huge browser, had no time to react. The tail had snapped off even before Ruby's full weight had dropped on top of it. Detaching its tail as a last-resort defense, the surprised reptile scampered off into the undergrowth through an uproar of churned leaf litter. Removing one foot from her quarry, Ruby kept the still wriggling tail pinned under the other foot and skewed on its sickle claw as she lowered down and bit into the muscular tail. Post-tail-dropping muscle contractions spurred the body part to whip and writhe as if still connected, and she winced after catching a light smack by the tip across her brow.

Snorting, Ruby stomped the appendage and pinned it again, this time opting to bite the base. The hook of recurved fangs and serrations helped to saw into the morsel, cutting the muscles so the stubborn thing would at last be still. This peculiar trait of lizards dropping their tails was something she'd picked up from her parents' hunting, and it made them a relatively easy quarry to gun for. Even if you didn't catch the whole body, you got something out of it; which was more than most hunts could account for.

A four-toed foot stepped down again, the large behemoth shifting position again to find another tree to browse and paying the raptor no heed. As it went about its business, its enormity would churn up the entire canopy and send many a small, arboreal form scrambling away. Attacking such a powerful, enormous beast such as this was suicide for

any raptor; even if there was more than one. That was likely why the great beast didn't even pay her any attention. But the fact she could never possibly hunt this newcomer didn't mean food couldn't be had in other means, and her intuition had paid off with how it was churning up smaller animals hiding in the canopy.

Scarfig down the morsel of a tail, Ruby tilted her head at the big herbivore's path of green destruction and paced over to some of it to check for more. She still was far from full after fasting for days; this tail and the mammal from earlier wouldn't remove the gnawing at her gut. But, some food at least did offer enough to fuel the furnace within her warm body needed to stave off the cold and development of her eggs still unlaidd.

There was a rasping in her breaths and with it, a niggling desire to seek the sounds of a river. While the blood of some quarry had been taken, she was still positively parched.

The chill in the air was accompanied by small flakes slowly descending from the heavens. Ruby stole a moment to glance up and check the air pressure and current changes. The sky high above was marred with mottled gray, clouds having moved in to shade the landscape from the sun's direct light aside from a few beams breaking through. Despite the viridian greenery from the shores to the canopy brought about by the fertile alluvial rivers, this landscape was hardly tropical year-round and cold weather into Spring around this time of year wasn't unknown. Snowfall or possibly even a storm would possibly come soon.

Ruby herself hardly felt the mild chills in the air, thick feathers and her body constantly burning energy to stay heated fixed that. But the nest was another matter. She'd been atop the eggs almost constantly for multiple days and nights, but hunger and thirst from fasting so much had spurred her to forage where she could today.

If a storm was oncoming, with a front of cold air at its head, the nest would need some adjustments while she took her necessary excursion to find water and hopefully more food. If her body ran dry of its reserves, she couldn't heat the nest and her valiant defense of the eggs at noon might have been in vain.

Still, the nest always came first.

Carefully and quietly walking next to the browsing goliath, whose broad, four-toed feet were larger than her whole body, Ruby was quick and unaggressive. She tilted her head from side to side to look about the selection before picking up a few of the softest leafy twigs in her maw. Taking her prize and some springy mosses, she jogged back to the glade and home. There was lots of greenery about, so the big-clawed behemoth still had scarcely noticed her beyond a brief grunt at catching a glimpse of the inconsequential little red thing moving away.

Heading back for the nest and ignoring the roughening within her throat from being so parched, Ruby got to work. The air was getting progressively more and more chilly. The change in temperature was incremental but noticeable from the high atmospheric winds chilled by the snow-laden clouds billowing down. Flakes of white already started clinging to the greenery.

Placing the soft mosses and leafy greens atop the eggs before sitting on them for a time, Ruby puffed out her feathers to directly expose the insulation and eggs to her heated skin. She shivered, trying to put out as much warmth as possible. By the time a probing with her sensitive snout confirmed her family of blue eggs would be nice and warm for at least a while, the sun had already crossed the mouth of the nest. Nightfall would be within a few hours, and with it the temperature would get even colder.

Content in her work, Ruby got up and left the nest with haste. She only paused to double-check the surroundings, confirming that there were no more intruders about the homestead. The large browser evidently had moved off, but the direction of its departure was indicated by both its wide tracks and numerous broken twigs cut into the canopy.

By fortunate happenstance it seems like it was heading to the riverside for a drink as well. Its trodden earth and trail of broken foliage helped to expedite the raptor's departure.

A snowflake falling on her nose was another confirmation on how she'd have to make this quick.

## Chapter 4 - Setting Sun

The riverside was virtually another biome in itself. The warmth of the water beat back all but the strongest of cold weather, the steady flow generally guaranteeing it wouldn't freeze over. Masses of floating plants and reeds covering the shallows gave the appearance of expansive savannah and shrubs, making it difficult to see where exactly the water started and land ended. The meanders within the river weren't especially fast flowing, but there was always a steady hum of trickling water moving through the air. The trees on the borders of the river were especially dense, many of them overhanging the marshy shallows, with a few more water loving varieties managing to take root within the center of the river itself.

The canopy was relatively untouched. Some of the largest browsers were those living sauropod juggernauts weighing multiple dozens of tonnes that seem to reach the heavens with their long necks, as they dwarfed even the large-clawed giant Ruby had seen earlier. Those true behemoths however, usually avoided the marshy grounds and abstained from rivers. That meant little to cull the overgrowth where trees could survive. Only a few rays of sun illuminated the landscape beyond the relatively open core of the flowing waters, a curtain of brightness that contrasted sharply with the dark understory.

There being plenty of shadows to hide in was a rare welcome comfort to Ruby. Areas like this always made her nervous.

It was a strange paradox that the riverside seemed to simultaneously represent life and death to anyone who beheld it. Within the mind of the young huntress however, such terms were only summarized in that it was both a critical resource and an area to be avoided unless necessary. Smaller animals, her typical quarry, didn't come to drink often. The usual game she took, comparable in size to herself or smaller, got most of their hydration from their water-rich leafy food or smaller pools they might find in the forest. Animals a lot bigger than her frequented around here. Predators often staked out watering holes or rivers to ambush their quarry, and she'd already seen one much larger dinosaur today back at

the glade. While her previous passerby was not especially threatening and a vegetarian, not every big threat ate meat. Quite a few didn't.

Very cautiously stepping out of the tree line and trying to stay low, Ruby tried to pay heed as to where the water line was without stepping into too much mud. Even with her relatively moderate weight compared to some passing through here, her feet were very narrow and didn't distribute her weight very well. They were already starting to sink in past the toes. Another step was taken and her body jolted sideways, the raptor mutely cringing at her slip that buried all of her toes into the mud. While she herself was quiet, the slosh in the muck wasn't.

A low rumble vibrated the air and water, and yet wasn't created by the wind or current.

Ruby froze, hunkering as low to the ground as she could. Her head rapidly twitched side to side, trying to get a bearing on what might be about but meeting little success. She was completely surrounded by tall reeds and stout groves, thankfully camouflaging her in their shadows despite her red colors, but also making it all but impossible to see more than an agonizingly short distance ahead.

After a minute, standing perfectly still, she very slowly extracted her foot from the muck that had been trying to swallow it. A sense of sinking in was already evident no matter how lightly she stepped. This reed laden ground was just too soft to stand in and a dangerous place to be, offering very bad visibility. Making matters worse, the stale air held in place by all the foliage meant smells that might offer warning in flowing breezes were stagnant. Stepping out of cover meant exposure, but it was preferable to getting bogged in place blind or left without notice of anything that might be a lot taller and able to look down.

Practically tiptoeing, the *Adasaurus* crept along to where the foliage was loosest. The sound of the river was greater now, and sure enough the foliage started to shift from rooted reeds and shrubs into a transition of floating water plants. The ground was still quite soft, submerged under a thin layer of water that went past her toes, but firm enough to stand on.

Just how much the air had been stationary and held in place by the marshy garden Ruby had been trekking through became abundantly clear once she got into the riverway itself. The mouth watering aroma of soft,

partially decayed meat quickly flooded her nose. Poking her head fully out of the reeds, the source was self-evident in moments. Rocking back and forth slightly in the flow of the river, apparently caught on the bottom of the shallows enough not to get towed downstream, a large carcass protruded out of the water lilies.

The creature had evidently been dead for some time, laid on its side halfway out of the water with scavenging insects buzzing about the corpse. The girth of the belly that was already wide to begin with was swollen up slightly like a balloon from internal gasses building up inside it, which also left the limbs jutting upwards. The span of the back from neck to tail was at least four meters, and the large head itself added another meter. In length it was double that of Ruby, and the animal, when alive, had to be at least a few dozen times her mass.

The body was stout, with a long tail terminating in a widened mass resembling a club and four broad legs. The head was relatively short, ringed with short horns erupting from the corners of the top and lower jaw not unlike a gargoyle statue which wouldn't exist for another seventy million years. Studding the body from head to toe, chiefly on the back and flanks, bony plates formed a loose suit of armor that complimented the horned head and club tipping the tail. In a few places, such as the broad beak, there seemed to be a bit of dried blood on the body, a dark reddish brown crust visible here or there. Ruby recognized this sort of beast well, for even if it wasn't the largest herbivore in the forest by a wide margin, it was still many magnitudes her size.

The *Tarchia* had been dead for some time, though the cause of its demise wasn't easily seen. There weren't any obvious parts of the body missing yet to clue in to a predator or prior scavenge dismembering the body, leaving it intact. The stored-up gasses trapped in the internal made the limbs stick out at wide angles, like some kind of macabre balloon animal only further clued Ruby in to her being the first scavenger to arrive here beyond the bugs.

Gouts of flies clouded around the carcass where it wasn't submerged, picking at the edges of flayed and split skin across the belly and dorsum. Ruby's stomach rumbled as she observed the carcass wearily whilst satisfying her thirst. Dipping her lower jaw into the water in a jabbing

motion, she tilted her head back to let it run down her throat. All whilst keeping an eye on the carcass with anticipation.

Sating her thirst quickly, a testing step into the water line confirmed yet again that it wasn't particularly deep in this spot. Every single subsequent step towards the carcass was made with the same level of probing. In a few spots, the depth increased drastically very suddenly. Deep holes surrounded the sandbar that bridged her closer to the carcass. The riverway was still quiet, nothing but the various varieties of plants and maybe a few distant birds flickering between the trees. Aside from a small hill of earth jutting out from the water across the river, covered in mosses and twigs, the terrain was near completely flat above a water line. Below it was a different story however.

Swaying her tail to gather up balance, she sprang forward whilst flapping her wings to control her fall and extend the jump. Ruby landed on top of the carcass, blowing some of the flies back and fully emerging into the light. Sunbeams of the dimming horizon cast themselves through the edge of the canopy that the *Adasaurus* had just glided out from. Her rusty red feathers with their green eye spots on her wings and tail respectively, contrasted with the dim blue of the dead body's scaly hide and emerald masses of water plants covering most of the river nearby.

Standing in broad daylight caused her nerves to tighten and wariness to compound as she landed on the belly of the dead beast. She was very visible now, and knew it. She'd have to be quick.

The buzz of flies and a trickle of the waterways was the only noise greeting the prehistoric beast. The waterways seemed to be abandoned by other animals aside from a few birds still moving about in the canopy. A few of them, with little toothy jaws and broad wings, almost seem to be looking at her with anticipation as they hopped about on the branches and tilted their heads at her. They were likely waiting for what looked very much like a bigger version of their kind to open up the carcass more so the weaker scavengers could have their turn. Ruby silently went about doing just that, though only for her benefit.

This mass was huge compared to her and she could never hope to eat most of it before it rotted, not to mention she couldn't risk being away from the nest for too long. A few big mouthfuls should be enough to sate

her for some time, even better if she could carry some back to the nest. Now if only this buffet was as soft on the outside and not so hard to get through!

Even whilst avoiding the armored scutes studding the top half of the *Tarchia* chiefly, the belly was still thicker and tougher than sun baked leather.

Her sickle shaped claws did manage to pry through the first couple layers of skin, but the hide was almost as thick as the raptor's talons were long. Getting at least some grip, she probed around with her snout before biting down on the cusp of the skin to try and rip some of it free by tugging backwards and using the hook of her teeth. Usually when scavenging she would just go for the spots already torn into by either the predator or some prior scavenger, or target the softest spots on the body. But the softer flesh like the mouth of the ankylosaur was mostly submerged and flies had already gotten to the eyeball.

The span of the belly was where she was biting and trying to gnaw away, but there were still curiously no bite wounds to suggest it died of a predator. In fact nothing on the carcass besides the spots the flies could get at implied anything had been eaten. And with no pre-existing tears, there was no prior dining to capitalize on. Instead the chest looked like it had been crushed in, the expanse of the rib cage visibly pushed down in an area wide enough for Ruby to sit in as the skin wasn't broken. There were a few spots the skin had been flayed though, three drag lines that either scraped or pried back the scales; with some scutes ripped free of the hide they studded. Like great, horribly hands had clutched and raked at the body whilst grappling it. Ruby hopped over to one of the jagged tears and tried to pry at the skin there with only marginally more success.

Without warning, a sharp pain wrenched through her internals, causing the raptor's muscles to seize as something moved. Her feathers stiffened and raised before lowering, the contracting convulsions briefly jarring her whole body. It wasn't hunger pains, even if those were omnipresent. This was something else she'd have to handle soon. The *Adasaurus* hissed a whimper and attempted to shake off the wrenching within her body as it subsided slightly. For now, with the pain dulling, she had to focus on the food.

Ruby was just about to try and peck those spots, when a rumble that sounded almost like rolling thunder seemed to reverberate through the water. She felt it as much through her feet as she did in the air. A ripple shot across the river, moving against its flow. Ruby's widening eyes tracked onto movement and her head snapped over to train her gaze at it. The hill jutting out of the water was moving. The floral green of its messy expanse was moving under its own power, tightening of muscle just barely visible under what was decidedly not just moss; but algae covered feathers.

Like some emulation of a shark fin cutting through water, the mound pushed against the current. Something stuck up from the waterline five meters ahead of the mound, the heavy puffing sound it made and a small geyser of mist spewing out into the chilly air betraying the existence of something big, walking on the bottom just below the water, coming up to take a breath.

Through the lilies clogging the surface of the river where the animate hill was, a pair of eyes looked out from under the greenery covering its head. It was looking right at her. The hill wasn't a hill, but an entire back.

Suddenly, erupting from the waterline like a great submarine cresting out of the seas, a beaked jaw rose up past the lilies. River water billowed down the massive neck and head before it came snapping down both on the lilies and the underwater foliage the titan had been grazing on. Entire waterfalls cascaded down its body as it started emerging from the depths, the colossal mass stood up straight and stepped into shallower portions of the river. The constant deluge of river water from its form and deep rumbling from its lungs had it move with the sound of a rainy storm.

And yet, as gargantuan as the giant looked compared to the now very startled Ruby, all the impressive display like a force of nature alive had been was simply the living enormity standing up straight. Getting out of deep water it had been walking through, it hadn't even submerged past its chest.

The neck was both thick and long, a cape of green stained feathers across the back with the throat bare of plume or scale. While all four limbs were huge and thickly muscled, the legs were twice so and supported the entire body. Stepping further into the shallows, the top of a huge, wide

foot with ample padding and stout claws indicated the beast's ability to stand in mucky ground with ease despite its great weight. The arms, held with the elbows bent, were like tree limbs tipped with three thick, long fingers terminating in hooked claws. The tail was quite long and broad, swaying side to side lazily with a tuft of large plumes emanating from the tip. Its torso was powerfully muscled and broad, a raised ridge above the hips which had resembled a mossy hill previously when it was left poking out of the water.

The face was perhaps the most bizarre feature. A human witness might compare it somewhat to a broad jawed gestalt of a pelican and duck. A toothless beak with a widened tip, the bottom jaw bearing a swollen throat pouch that extended halfway down the neck. In general color the gigantic creature was typically a dull bronze across its body, with a reddish throat pouch and yellow bill. Much of the form however, especially across the back, was stained green with algae and chlorophyll.

Using their powerful arms and hooked claws, the horrible hands of which *Deinocheirus* got its name, the king of the river took another two handfuls of lilies to stuff into its awaiting bill. Each hands' claws, three in number, were pointed and hooked despite being flat across the inner edge as to be a scoop. Enough to leave flaying and stab wounds if they snagged on flesh, despite the giant being a herbivore. One of its broad feet raised again, stomping down onto a sandbar.

Ruby's nose dilated as she took in the newcomer's smell, detecting small traces of it already around her. Or rather, beneath her. She looked down to confirm it, smelling the slashes in the hide, the claw wounds, and crushed rib cage. The smell of rot covered over much of the stench, but another presence was perceptible. The *Deinocheirus*' eyes locked onto the span of red atop the carcass of the *Tarchia* he'd killed a few days ago by trampling.

There was good reason no major scavengers had chanced to get close. Early Spring was mating season for the giant humpbacked beasts. And for a male to secure a claim, he had to find a patch of riverway and defend it against rivals. Certain hormones surged with the intent to help him do just that, but there were some profound side effects to entering the state similar to rut in stag elk or musth in bull elephants. The *Deinocheirus*' feathers bristled, hackles raised as his breath started to

pant rapidly with building stress. The river king's pupils were contracted to pinpoints in a clear indicator of adrenaline overdose. At seven tonnes of raw aggression, the *Deinocheirus* looked crazed, insane.

Enough to attack anything nearby, even that which was no threat to him. A point of view almost five times her head height bore down and glared at the *Adasaurus*, who was beginning to backpedal.

The reverberating bellow it let forth to gush from its parted jaws could be favorably compared to a foghorn in both intensity and utterance. The *Deinocheirus* stomped and wade forward through the river, water being thrown up all around it with muscles rippling as he bore down closer to the corpse of one victim with the intent to make another.

Ruby's instincts at once kicked in but with contrasting defensive maneuvers. She initially started to hunker downwards and lift her tail-fan whilst holding her wings to her sides. Large green eyespots and a rusty red midline flashed and were borne like a banner in the bright sunlight. The display began to craft an image that caught the *Deinocheirus*' attention briefly. In a more stable time of year it might have even backed off upon recognizing what Ruby mimicked the appearance of, but this was not the time. Berserk, multiple tons of raw aggression continued to come barreling at the *Adasaurus* like a freighter ship dividing the seas in a collision course. There was no stopping it, not even for a second.

Instead, the *Adasaurus* had to opt for plan B. Jump off the corpse and try to get on dry land to leg-it out of there. She turned and sprung to do just that, flapping her arms and holding them outwards to enable any small boost to her jump and glide as was possible. Landing hard on the mucky ground, that splurged and sucked in her footing, Ruby shook all over whilst wrenching her legs from the mud step-by-step. Each pace just caused her to sink in again, and everytime she wrenched a foot free of the muddy hold, the other one just sank in more.

Dragging and hobbling through the reeds and rushes, Ruby felt a surge of river water spill past her feet. Chancing a glance back by cocking her head to the side, the raptor was witness to the enormity of its pursuer comed erupting out of the waters. A living tsunami charging onto land with waters displaced heralding it in a wave. Struggling and hissing in fright with her pulse pounding in her ears, Ruby jumped and beat her

wings to try and push herself forward. All of her efforts were granting herself just fleeting moments more of not being mired in the muck in her desperate retreat to the forest and dry land.

The haggard huffing of stale breath from her pursuer blew past her ears and clogged the nose. The deep clack of a snapping beak audibly nipping at her tail feathers and gaining. The sharp pain in her gut returned again in force, the jarring of it causing the raptor to stumble.

A shadow cast over Ruby's form just as she worked through the internal pain that had come stabbing through her gut once more. Springing up as best she could, the *Adasaurus* tried to clear the reeds in another desperate jump. There was a grove of trees just beyond the reeds, but the smell of the river's king was heavy in the air.

That was when Ruby spotted a familiar shadow on the shore.

A tree amongst the canopy soon showed itself to be no such thing when it moved, rearing up further in surprise at the oncoming *Deinocheirus*. Ruby seized upon her chance to take the shortest route possible into the hard-packed ground of the forest floor, darting right between the two towering pillars before her.

That said pillars weren't trees was indicated in how they terminated in four-toed feet. The massive browser she'd glimpsed earlier had also come to the river to drink. It's arrival was to her unwitting ploy of distraction. She ignored the confused rumbling coming from the giant browser high above, as it reflexively moved a foot in a staggering backstep, but had its full focus on the oncoming freight train of a *Deinocheirus*.

Bracing itself, a giant roughly equal in size to the enraged river king assumed a readied and threatened stance. Thick legs coming from a wide body anchored into the sandy ground bordering the swampy river, with the short but girthy tail almost touching the ground from it rearing up. Unlike most other theropod dinosaurs like Ruby with a roughly horizontal stance parallel with the ground, the configuration was pivoted upwards to stance upright with the head over six meters off the forest floor.

In terms of shape one could compare the long neck and beaked face to a swan or goose. The resemblance was strengthened by the cape of feathers covering much of the body, densest across the shoulders and tail. The plumes were a dark green and gray in color, except for a span across the chest forming a bright crescent of white. A fan across the end of the tail and short plumes on the arms resembling tiny wings belied some distant relation to Ruby herself.

But it was not the stature or size that gave the *Deinocheirus* brief pause, but what the new giant extended in a clear threat. The arms were enormous, thickly muscled and nearly as long as the legs. The short wings attached to their lower extent and fingers made them look even larger. Each of the three digits were tipped with enormous talons, shaped and edged like scythes. It was this feature that would one day give the giant its name. *Therizinosaurus*, the scythe reptile, a fitting name given the largest talons were a meter long.

The two giant herbivores, living mountains in comparison to Ruby, were in a stand-off. The big-clawed forest titan spread their arms wide to give them the greatest reach as they stood to their tallest height whilst hissing. The river king was initially taken aback by the giant browser's surprise arrival, his focus having been on the small nuisance its hormone-addled mind compelled to attack and he was surprised by the comparable sized behemoth before him. The *Therizinosaurus* continued to backpedal, not having sought any conflict today. Its hackles of feathers raised and many throaty hisses were uttered all the while, trying to avoid a confrontation between it and the other most powerful herbivore in the forest. The long claws on its fingers flexed back and forth, rattling and rasping as they slid past each other

But the pause for the wrathful was only temporary.

A reverberating bellow rumbled out from the *Deinocheirus*' chest to its maw, enhanced by the swell of the inflating of its throat pouch that was flushed with bloody reds. The humpbacked beast spread his own arms out, equally muscled with large claws of their own; swords brought to bear for a duel. The *Deinocheirus*' beak clacked and snapped in hollow thumps, deep thumps audible each time as he chomped at the air. Rearing up to do its best at equalling the *Therizinosaurus*' height, it was clear that while the scythe reptile was somewhat taller and had a greater reach with

its longer claws; the horrible hand was slightly heavier and had a more formidable beak and jaw to compensate.

The *Deinocheirus* wasn't intimidated away, its chest rumbling as earth shook with its forward charge. The gape of its maw flew open aimed at its rival's neck, and the sharp edge of its beak clangoured when it snapped upon empty air. The forest titan had backstepped and weaved their long neck aside to avoid the snap, returning a blow in kind by jabbing one of their arms, once held-aside, inwards with the points aimed at its attacker.

The river king grunted audibly, blood trickling from a slash wound at his flank and shoulder where the tips of their rival's talons dug into the body until glancing off the flat of the shoulder blade. He responded in-kind by not halting his prior charge, bodily tackling the *Therizinosaurus* and bear hugging it to bring its own claws to bear.

The *Deinocheirus*' claws stabbed into the forest giant's back as his powerful arms hooked around the other giant in a bear hug. The broad span of his bill snapped across the *Therizinosaurus*' neck, lightly cutting into the skin as they both wrestled about.

A throaty hiss chortled out of the injured, but not maimed *Therizinosaurus*, who returned the wound in kind with a smack of their other arm upon their attacker's flank; staining the attacker's bronze and green hide red in drawn blood. River king and forest giant wrestled back and forth with thundering footfalls that ripped apart the ground as their backs tore through the canopy.

Ruby desperately tried to get out of the way as the clashing giants wound up in her midst. She was caught in the melee, accidentally winding up directly between the combatants in a whirling spinning circle of stomping feet and shoving masses. Her chest panted and heaved as she jumped, wove, and ducked to avoid getting clipped by the rapid stomping of limbs that were like tree trunks shooting down from the sky and shaking the ground.

The two giants staggered and stumbled about, neither having the clear upper hand as they grappled. The sky about Ruby was a dizzying mixture of sunbeams and shadows when the battling behemoths literally stepped

over the raptor they were both witless to the presence of, earth that was still quaking constantly being churned by their massive limbs as their towering forms seemed to scrape the heavens. Their mutually long necks twisted about after the river king's biting hold was broken; with either trying to bite the other now, beaks clattering and snapping in the midst of their brawler's lock.

Seeing a window between their legs, the panicked *Adasaurus* took her chances and dove for it. Flapping her wings lightly to boost her jump for distance, Ruby found herself just barely getting free of the chaotic melee when her tail was clipped by one of their legs whilst midair. Knocked off balance, she would have tumbled had it not been for careful correction with her flapping. Stumbling on her landing, the raptor took a moment to glance back at the brawl; seeing from her perspective what looked like two giant forms of impossibly tall figures.



## Battle of the Bizarre

*Therizinosaurus vs. Deinocheirus* by Sumair Ferhan Syed

Ruby couldn't remain behind to observe the fight to its finish, her first instinct was to get out of the way to put as much space between herself and the clashing titans as possible. Her second instinct, kicking in as soon as she got into the treeline, was to return to the nest. Just as she got inside however, the pain within her body came roaring back. It briefly paralyzed her just as she got on top of the eggs, causing the young raptor to stagger and pant as she flopped down atop them. Each of the four grayed-blue speckled eggs individually were quite large, and they were equal to her own mass when combined; requiring careful movement and placement to shield them all.

The contractions within her body and dilations within spasmed again, the cause evident even to a young female like Ruby. These weren't hunger pains stabbing through her gut, as the soreness cut deeper. A fifth egg would be joining the nest soon.

Paralyzed by the muscle spasms for a span of time unknown, and held in place by the instinctive need to protect her family, the *Adasaurus* was helpless in her homestead when the ground began shaking again. Tree trunks and limbs composing the nest rattled, several loose timbers shaking free. All Ruby could do was hunker her quivering body lower onto the nest whilst trying to see out the entrance, as to gleam what was going on. The rumbling beyond was abrupt, reverberating from heavy footfalls. Too many for one animal.

A small tree trunk composing part of the nest groaned from strain and sagged with a weight pushed into it, then abruptly exploded into fragments and splinters. A massive foot crashed through the side of the nest, jostling the whole structure and snapping a dead tree limb like a wrecking ball through balsa wood. White, woody gut was sprayed like shrapnel across the interior, requiring Ruby to cover her face and eyes as splinters bounced off her.

Pulling its foot free of the breaking tree, having stomped through the large conifer sapling after getting shoved into it, the *Therizinosaurus* squawked as it staggered into the very forested glade it had been browsing in earlier. The trees of the glade's perimeter parted in the accompaniment of rapid footfalls as the enormity came crashing through

them. The *Deinocheirus* was soon on top of its target, lunging with opened jaws and spread arms whilst closing the distance and soon biting the swan-like neck of the other giant with its wide bill. While its beak lacked a significant cutting edge, more meant to shovel and scoop masses of water plants in its foraging, it had enough effort in the bite to break skin.

Trickles of red ran down the short feathers coating the *Therizinosaurus*' neck and dropped through the holes in the nest's roof atop the startled Ruby. The scythe-clawed browser stumbled backwards whilst trying to get its attacker off without causing the bite to tear further into its neck. A task made harder in how the *Deinocheirus* was bellowing whilst wrenching its head side to side in an attempt to maul. The back of the scythe-clawed beast's foot banged against the large thatch and branch structuring of the nest again, rattling the whole thing and causing some of the twigs and spruces making up the ceiling to fall atop the terrified Ruby.

The *Deinocheirus* released a loud wail in territorial and hormonal rage, sounding all the part of a fog horn mixed with raucous and demented laughter. It surged forward, bodily slamming into the *Therizinosaurus* hard enough to nearly bowl the scythe-clawed browser over. The river king raked his claws across the sternum and gut of its opponent, snapping at its neck with his jaws. They stumbled about, stepping over the nest and trampling the ground all around it. Another tree limb on the nest's flank groaned and explosively snapped from the back of the *Therizinosaurus* getting shoved through it, as the browser nearly fell on top of the structure.

Wounded but undeterred, the forest titan brought one of its powerful arms to bear and smacked the aggressive river dweller across the face several times. Claws clacked against beak with an echoing crash, with the bottom edges and tips of the claws cutting lines across the flesh they met. Wounded and dazed with blood dripping from torn skin near its eyes, the *Deinocheirus* was shoved backwards with a bash of the forest titan's shoulder bulldozing into its chest.

The river king staggered and backpedaled as over six thousand kilograms of angered *Therizinosaurus* put its full weight into the shove and ran forward. The fern tree trunk that had over ten tonnes of dinosaur pushed

into it never stood a chance, snapping near its base and falling down onto the glade amidst the quarrel. The similarly bloodied and irate *Therizinosaurus* hissed and lashing out further with its claws as it followed through.

Blood spattered the entrance to the nest, the motion spurring Ruby to reflexively jolt down and flatten herself against the eggs. Watching the battle through the portal granted only a fleeting view of the world beyond, and none served to calm her nerves alongside the stabbing pain in her gut. The river king's snapping jaws or swinging arms, or the forest titan's clattering talons and attempted stabbings. The shudders induced by both her own body and the shaking earth intensified in tandem, and Ruby's instincts were a contrasting flux. The urge to run and get to safety clashing with maternal needs to protect the eggs and nest, battling it out just as much as the giant herbivores were. From her vantage point the river king and forest titan both looked beyond gargantuan and might as well have been two forces of nature smashing into one another. Two tornados clashing and ripping at one another, heedless of what was in the way.

Digging their toes into the ground, the *Therizinosaurus* anchored themselves down and avoided getting shoved over before counterattacking. Wrenching their arms back, the claws previously hooked around the *Deinocheirus*' back ripped out straps of flesh on exit. Raising its powerful arms outwards, the scythe-taloned browser swung them inwards and stabbed the tips into the river king's chest. Ruby could hear the scraping of keratinous talon on bone, as the pointed tips of the claws glanced off and scratched the expanse of the ribcage.

There was a tremendous crash and Ruby's vision was briefly a vertigo of tremors from getting rattled. There was a great mass suddenly erupting through the timbers of the nest at her left side and a brief jolt of pain. It took a split second to realize one of the clashing giants had backpedaled and sent its entire foot through almost half the nest. Timbers had splintered and twigs shattered, one sharpened branch had raked her across the shoulder and back. The wound wasn't deep, but it wept enough blood to seep down her arm and dribble onto the nest.

The raptor huddled above her eggs, her hurt arm more limp than the other due to her injury. It was only by the flood of endorphins and

powerful instincts that Ruby maintained composure enough to desperately try and cover the eggs, to shield them from the two living wrecking balls shattering their home like twin tornados. Adding to her pains, the contractions from earlier came back, brought about by all the stress. Her innermost nerves and veins pulsed and sparked from movement.

Another giant foot came crashing through the wall, half of the nest now collapsed and sagging from the damage. By now the *Deinocheirus* had gotten free of the attempted impalement by its rival and was snapping at the long talons and fingers of the *Therizinosaurus*. Both giant herbivores brought up their respective right arms, each wrapped in thick muscle and tipped with potentially lethal claws, and swung. The clattering and crashing of their claws against each other was like short thunder booms to the small raptor caught in the middle of the storm.

A single blow from either of these two, not even a direct hit but just getting caught in the swing, could kill her several times over.

Ruby's only defense, with her body trapped inside the half collapsed nest unable to flee and her motherly instincts compelling her to not even attempt that, was that either creature dwarfed her by several orders of magnitude. If she stayed low, especially with their attention on each other, neither's talons nor jaws would be in range to strike her.

Hunkering down and helpless against the two clashing tornadoes ripping into her home, Ruby shivered and shuddered from endorphins and pains of her wound and contractions. She could detect another contraction deep within her pregnant belly and movement. It confirmed it; she had an egg finally coming, soon if the stress held up. The question of if she could defend the rest of her family before another was added to it was further and further unknown.

The interior of the nest suddenly became brighter. A large portion of the side wall had been wrenched outwards and left a gaping hole in the side of the nest, debris and broken foliage still raining down all the while. The roofing collapsed and sagged downwards, partially closing the gash in the wall but still leaving the opening to the nest several times larger than it had been. Sticks, mud, rotten vegetation, and feathers were spilled out across the glade's floor. In the setting evening sun, the glimmer of a tarry

substance spattered onto some of the torn-out construction of the nest were visible.

There was a scent in the air now, stronger than there had been before. Many hours at the nest had long since inoculated Ruby to the profane musk's presence beyond acknowledging it for comfort. Which made its potency to her nostrils as it lingered in the open air, after the nest was torn open, speak of how strong the smell was. The quarreling *Deinocheirus* and *Therizinosaurus* also registered the scent. The former had been circling about, having recovered from the scythe-clawed browser virtually throwing it into the ground to impact the nest. It had just been about to charge and resume their quarrel when the scent hit it.

All Ruby could see was the river king's feet, broad pillars visible through the hole in the nest alongside the very fringes of claws. Blood ran down its leg from the numerous stabs and gashes the *Therizinosaurus* had inflicted in its defense. Across from it the four-toed pads of the scythe bearer stood readied, the tips of its claws lightly digging into the ground for anchoring whilst it stood with its arms wide to threaten and counter if needs-be. The high browser from the forest had also smelled the odor, but they remained rooted in place lest the *Deinocheirus* resume their battle. Red droplets and sanguine stained feathers dripped down onto the grounds in front of the nest from numerous bite and claw wounds.

A low rumble slipped through the air, one both of the titans took notice of. It sounded faint, distant perhaps; but it was recognizable all the same. They knew the creature that typically made that call, a deep rumbling much like the roll of thunder. Hackles raised and both turned their heads about to look for signs of an oncoming force. In a healthy state, neither would have much to fear of the caller. But they, two adults in their prime, had a long memory. Memory of the decade prior when that call meant death when they were smaller and more vulnerable, as it had for many of their siblings or younger rivals. And after their quarrel, neither were in a peak state.

The *Therizinosaurus* hissed deeply, loosing a throaty utterance from the depths of its belly, trying to further dissuade its attacker from continuing this conflict. At this, the *Deinocheirus* finally paused. The smell in the air, its wounds, the call all coupled with the *Therizinosaurus* proving

itself a formidable opponent was enough to jar the instincts of the *Deinocheirus*.

It finally took a step back without getting shoved, leering and chuffing a grumbling from its gullet all the while. He had gone far from the riverside and as far as he was concerned, that was far enough to drive off a rival. The scythe bearer, ignorant to the intent behind the river king's hormone addled mind, just remained in their threat display with their arms spread and neck held high; warbling with raspy huffs of breath.

The *Deinocheirus* slowly backpedaled foot over foot into the forest and back to the riverway as its immense, algae covered body started to meld with the greenery of the trees. It took a solid minute for it to fully depart, turning and returning to the river. The *Therizinosaurus* lowered its guard stance and at long last relaxed most of its muscles in panting heaves coming from its throat, there was a mountain of weight off its shoulders as it could at last relax, somewhat. Not entirely however, as the rumbling call hadn't silenced. Not keen to get into another quarrel, the browser similarly limped off in the opposite direction of the river.

Both giant herbivores had utterly trashed the glade, tearing up the ground, knocking over saplings on the edges; and shattering parts of the canopy. In their wake the glade was a scattered mess with coagulating blood, loose feathers, and broken remnants of lumber and vegetation making up the nest strewn about. Inside the nest, the rumbling continued but its source was not what the giant herbivores had mistaken it for.

Ruby stood guard over her eggs, shivering and shaking from sheer stress and fear even as she continued the call. Her body released another few long seconds of the bellow, a low utterance that did not comply with her small frame.

It was the same signaling bellow she had used upon entry to the glade this morning, and had been cast with the desperate plea to call for help. She didn't have the faculties to know it might dupe the clashing titans into thinking something else they might fear was nearby, but the instinct to make use of any asset she had on her just might have saved her and her family's lives.

Adrenaline tremors blurred her vision. The exhausted raptor, sore and still in pain from her shoulder wound and inner contractions; collapsed

on top of the eggs. The last of the energy Ruby had before passing out was used to wrap her good wing around one of the speckled blues to pull it closer. It was still beginning to snow, and they'd get cold without her body. She still had her instinctive duty to fulfill and she wouldn't let her first clutch be a failure as long as she could breathe.

Even that was labored from her injury and inner pains.

## Chapter 5 - Night of the Raiders

Vision came fleetingly to Ruby's tired eyes that blinked open and closed, soreness felt in the corners of her lids that ebbed into every nerve.

Passing in and out of consciousness, all in a fluctuation of blackness of the mind that colluded with the darkness of the night outside to obscure the world and passage of time. Behind her eyelids when they were closed, a mishmash of stressful memories returned and caused her body to twitch and tense in fitful rest. It was a nightmare, as an animal might understand it.

The drumming of her heart beat intensified, pounding between her ears with thickened pulses pounding at her skull. All her senses were taken up by a whirling cornucopia of glimpsing her mate's limp body, the pungent breath wafting over her neck, and the yellow eyes floating behind a spiny snout snapping at her heels. Her pulse spiked and she reflectively kicked out, trying to gouge her claws at the maw which had caught her wing in its serrated ivories. Flesh gouged and her own broke, catapulting Ruby awake with a shock of pain surging through every nerve in her arm.

It was a small mercy that the dimness behind the *Adasaurus*'s often closed eyelids at least granted a sense of night vision to keep her eyes adjusted to the darkness in the intervals so that she could see. Another painful pang from her contractions coaxed her exhausted body to begin fully waking up, spurring her along to awareness. Her breath was heaving dreadfully, sapping energy from her tired body.

The raptor groaned weakly, trying to work through the soreness and take in her surroundings. Her head cocked aside upon feeling a toughness at her foot, a smooth expanse which was quite sizable compared to her even if it was smaller. The *Adasaurus* perked up slightly upon seeing one of the eggs, still half rolled from the core depression within the nest; either jostled free or possibly nudged out by her kicking foot. In her nightmare she lashed out at an imaginary monster of the past, but now the mother had a waking nightmare born of instinct upon realizing an egg was alone.

Turning about to face the opening to the nest again, Ruby very carefully opened her mouth and closed it upon the egg. Tender and slight in every

movement, she was careful to not so much as let a single tooth scrap the shell as she tugged it back to her embrace. Rolling it beneath her lifted wing, the raptor hissed quietly to herself as she probed and checked it over. Her racing pulse should have slowed upon feeling the egg still warm, still viable of life and not doomed from an unconscious mistake in fitful rest.

But, it didn't. The yellow eyes and sharp fangs were still in sight, and her regrown wing still ached. Ruby knew not the context for what her mind perceived, nor how she did, but something was apparent. Her hackles remained raised slightly, her pulse wasn't slowing down, and her senses only continued to sharpen without obvious cause. There was something very, very wrong. It hadn't been just a nightmare or feeling the eggs, the one aside or the one within, which had roused her. Through the low-to-the-ground hole torn into the nest, she looked out to try and ascertain what had pulled at her subconscious so strongly as to rouse her. It wasn't yet from her labor, something else had done it.

The forest was dead. Quiet with scarcely more than a breeze. Through the veil of the broken branches and rotten vegetation that composed the half collapsed nest, she could only see dark trees, stars, and two specks of light off in the distance. Any motion the eye could track through the foliage and timbers was mostly keying in on the steady, sparse flecks of snowflakes slithering down from the heavens. There was something there, something imperceptible, perhaps, but noteworthy all the same. It was too quiet and too still.

The forest titan and river king were still gone, thankfully. She was alone again, with territorial giant or potential nest robber unseen even if she got the sense there was danger afoot. The cold outside gnawed at the skin, spurring the worn down mother to pull the eggs closer under her protection. She couldn't see the threat her instincts forewarned of, nor hear it. And the drafts of the breeze that did subtly worm their way through the gaps in the walls of branches of vegetation composing the nest had indicated nothing downwind of her.

And yet, something had gotten her attention and still had it even though she'd awakened; and that could only mean one thing. By a subtle scent she couldn't pick up or a noise heard while asleep, it wasn't a dream that had roused her. Something was out there, even if touch, smell, and

hearing couldn't actively detect it. Her weak and tired eyes were her only aid, and they were feeble by fatigue and hunger. Even when coupled with experience telling her whatever it was had to be downwind of her as to narrow direction to search, vantage point was difficult. The original opening to the nest, one part access hole and one part skylight, had been crushed down by the brawling herbivores. Instead it was widened and sagged, extending across a large span of the nest but being very low to the ground where the walls collapsed and bent over the roof. Seeing past it was troublesome and she didn't want to leave the eggs.

It took some finagling and clambering for her shaking and tired frame to haul itself over enough whilst not leaving the eggs to see well outside, by putting the side of her face and eye through the hole.

A subtle shift in the wind puffed into her nose, and like lightning through the nerves her body was shaken. Eyes widened as her frame quivered, with Ruby's pupils dilating to their maximum extent. The two tiny specks of light, once looking like reflected moonlight on dew so she had overlooked them at a glance, blinked.

Eyeshine, yellow eyes staring right at the nest from over two meters off the ground. Ruby very slowly, with cold terror coursing into her veins, backed away inside the protection of a broken nest. A puff of misty breath against the chilly air to swirl around their head all but confirmed the intruder's presence.

The memories and nightmares, perhaps caused by catching some brief scent or sound of what had come, were only echoes of what had come in regards to the dread they incited.

Her sharpest instincts and yet worst fears were realized with the same information. She was not alone, and the most dangerous unknown was her company. Across the glade, covered in the distorting dappling of the canopy breaking up starlight, a large form previously unseen was standing perfectly still whilst obscured by a grove of trees. The large, three toed track; the exact one Ruby had crossed to enter the glade, was sniffed by a lengthy snout that greedily sucked in its scent and spoor.

The head shot up instantly, the twin speckles of eerie yellow widening with excitement. The eyeshine of a predator's amber gaze blinked after it had finished studying the giant footprint neither the *Therizinosaurus* nor

*Deinocheirus* had left. Its own near identical, if smaller foot with skinnier toes, stepped into the track. The stalker stayed in the cover of the forests, barely more than an obscured silhouette even to Ruby's night vision. And yet as it moved along, its body shifted with every careful, muffled step; its head remained perfectly level and locked upon the nest. Broad nostrils huffed and siphoned in air above a broken off piece of the nest the tarry scent marking was stuck to. Scent confirmed the odor of the same foul musk that helped drive the mad river king away. But instead of running from the predatory marking, this creature followed it.

Another step through the shadows and foliage, and memory again pricked at the back of the *Adasaurus*' mind with further clarity. On how she found this place to begin with on that fateful night. She had not the mental ability to hope against fears the way humans did, but even an animalistic mind could still comprehend wanting to avoid that which terrified her and not wanting to experience it again. Fear for animals often meant that fear represented a mortal danger, and she had already once encountered possibly the greatest one to her kind and escaped with a loss to her life with her deceased mate. With another pulse ripping through her body to batter at her skull, phantom pains stung at her arm from where her wing feathers had once been torn out.

The yellow eyes blinked again, winking out of sight when they stopped reflecting moonlight for the briefest of moments but had ducked underneath shadows. They were still looking directly at the nest with intent.

Ruby tried to rise in alarm as she recognized the visage of what was coming, only for a sharp pain in her gut to tear at her body from within. The intensity had increased by an order of magnitude since her early contractions, and it left the *Adasaurus*' whole body quivering. She heaved and gasped; despite being painfully aware of how loud her breathing was due to the labor pains. The movement of the egg within her demanded she not flee, despite primal fear compelling her to do something about death stalking closer. All she could do was hunker down onto the eggs and keep a shaking, quivering eye on the intruder to the glade.

The intruder which antagonized instinct and memory in equal measure to send her blood pressure surging, every single pulse bouncing off the

inside of her skull in the throes of labor.

The intruder's long snout probed at some of the destroyed debris that had come from the nest, specifically to the tarry scent markings that had become exposed earlier during the battle. Nostrils palpated and dilated with great volumes of air being sucked in and studied. And despite the exact same signals sending two giants into retreat, the night stalker again did not backpedal. In fact they did the exact opposite of fleeing.

Turning their head aside, a near silent bellow rumbled out from their jiggling throat. It was similar to the deep resonance, the rolling thundering Ruby herself had used earlier; if at a much higher pitch. A few moments passed before two more identical cries came from the forest. The thudding of footfalls was muted in sound and only perceptible through the subtle shaking in the ground, heralding the arrival of twin blurs pacing up beside and skidding to a halt as they flanked the original intruder.

The very scent that drove the others out was the very scent they had been searching for after all these months, and they would not be leaving easily. Now that they were together, courage of a sort had settled-in to choke out prior apprehension. As a group, the terrible trio began to step into the glade's boundaries.

Long snouts started to emerge from the dappled star and moonlight splintered by the canopy, piercing the perimeter of the nesting site. Silver beams illuminated a ridge of spines lining the length of a long snout. A quiet chuff and testing of the jaw opened the maw enough to retract the otherwise static lips, flashing a tightly packed line of serrated knives for teeth. The top of the snout was corrugated with a ridge of keratinous plates, all of which overlapped to be tipped with a spur to adorn the dorsum from the nose to the brow with a line of short horns. The brow similarly jutted out and worked with the snout horns to give the narrow-jawed face a pointed and jagged appearance.

With her eyesight blurred from labor pains, Ruby couldn't make out color easily despite her night vision. She could clearly see shaggy feathers starting just behind the brow and encircling the eye before traveling backwards. The filaments, which looked very much like the needles and leaves of the forest for camouflage, formed a cape across the

back in contrast to the otherwise scaly skin. Small arms that terminated in two-fingered, clawed hands, flexed.

Their talons wiggled in anticipation as the bipedal beast cautiously stepped closer and fully into the light. Nocturnal adapted eyes maintained the reflective light from above, twin lanterns flickering in eerie yellow-tinted luminescence as it fully emerged into the glade.

Even if small compared to the clashing titans of earlier, each intruder was still easily thrice Ruby's height and many times her weight. And unlike those two battling behemoths from earlier, the reflective eyes and sharpness of fang made it clear these were hunters. Predators that Ruby's instincts terrified the huntress of for good reason. She'd been fortunate to have gone months of her life without being choked by the scent of hostile death itself in the air as it was now, half imagined as the smells were from memory.

Recollections of having made the mistake of not sleeping high enough in the trees or nest one night alongside her consort. She could still feel that rancid breath waft over her neck, jarring her to further alertness now as it had jarred her away then. That muffled, raspy breathing followed by an unnatural exhale.

The night stalkers, a trio of healthy adult *Alioramus*, with the leader in their prime and the other two not far behind. Named "Different Branch" for its uniqueness amongst the Tyrant Reptiles, the Tyrannosaurs, the familiarity nevertheless meant it was every bit as deadly as its larger kin. A pack of hunters, up to half a tonne once they hit their peak, few would ever see coming as it crept upon them as they slept and feasted. Each footstep into the glade, near perfectly silent and uncanny in how it could be seen but not heard. The many victims of the nocturnal predator often would have never perceived their approach, Ruby wouldn't have noticed them had strong memory at catching a trace of them in the air or perhaps her labor contractions not roused her rest, as her deceased mate wasn't as lucky the first time she'd met the pack.

The largest of the trio, likely the oldest and leader of the pack, put their uncannily long snout to another pile of debris from the nest that had been thrown across the glade by the battle. The nostrils below the crown of ridged horns dilating and swelling. Air was sucked in to take of the essence permeating from the debris.

The very scent that sent the clashing titans running was followed with intent by this creature, swaying its head to and fro to keep a wary eye on the forest as if watching for something. Anticipation bristled across its nerves, twitching its lips and occasionally flashing glints of serrated ivory fangs lining jaws bearing far more teeth than any other tyrannosaur.

Less than a dozen meters away, the leader of the pack paused briefly alongside its cohorts. The frontrunner of the trio pushed its snout against a pile of debris from the nest and the bloodstains engendered by the battle. Probing and sniffing the pile with dilating nostrils to ascertain what had happened here, Ruby instinctively seized her chance to try a prior tactic.

The deep rumbling from earlier seeped from her throat. Another alarm call, one whose low frequency and pitch that made judging direction of where it was coming from all but impossible. The night stalkers stiffened and froze, feathers bristling as they looked warily towards the forest, freezing in place and sniffing the air as a breeze slithered through the glade.

The instant the call registered to the invading tyrannosaurs, they reacted in a haste. All three perked up and snapped to alertness, rapidly darting their heads back and forth to survey their surroundings further. One of the subordinates almost seemed to reflexively bark in alarm, only for another of its group to briefly snap her jaws at them to hush the youth up. Bodies tensed with muscle tightened under scaly hide and feathers raised at their hackles. They knew that call and were afraid.

The lead *Alioramus* was less alarmed as their younger compatriots, but it still bore a visible caution. They took a step backwards into the darkness of the thick canopy, searching for a threat and caution averting prior plans. The call gave the group's leader ample cause for concern. While less startled as its younger companions, that call sounded like something the predator of raptors had good reason to fear; and the leader knew from experience.

Her chest burning and body still wracked with labor pains as it was, Ruby continued the call, spying the tri-clawed foot of the leader slowly lifting off the ground and backstep again to the forest. Their lackeys were already beginning to back up and away, dissuaded from their original

purpose. She shivered with strain as she watched the leader's feet further, waiting for them to continue a retreat. The *Alioramus*' body language was one of apprehension, unsureness and wariness in equal parts. Slower as the change was, they were clearly reacting to her call, and getting cold feet about what they'd come to do. The question was just which would give out first. Their resolve, or Ruby's rapidly diminishing and burning lung capacity.

The *Adasaurus* clutched her eggs to her with her wings, nestling them tight to her heaving chest as her heart pounded a pulse between her ears like a gong. Her painful breath was like a fire in the chest as she stretched out the call as long as it could go on for. She had to keep this up, even as her lungs felt like they were about ready to collapse from keeping the utterance going for so long. The raptor could only continue on, her only defense and a desperate plea for help there was no promise of being nearby.

Her partner had been away for so long! They had to be nearby, right? They always came back by now. They had to hear her and help, they-

Ruby froze and gagged from a painful sting racing up her nerves to strangle her throat. Pain stabbed into her gut and the raptor groaned in a short gasp, feeling the egg within her move. Her innards alternately contracted and dilated, pressure building up as it began to move further down. Of all times, the egg was being expelled now.

The top of the egg started to erupt from her nethers, tearing small fissures as it started to push further at the coaxing of the contractions. Her first given life was making her bleed, and that risked death at a time like this.

The lead *Alioramus*' grunted at the abrupt end to the thundering bellow. They sniffed at the air and its head snapped back around instantly. Nostrils flared and it tilted its head side to side like an owl, silently registering all of what was around it. The rumbling had made it and its pack nervous, but the reward for staying was too appealing to pass up now that it could smell renewed blood in addition to Ruby's old wound. With how quiet the call had been, the night stalker's mind had concluded one of the few things it might fear in the nightfallen forest couldn't be too close by. Animalistic logic and experience had taken the weakness in breath of a mother in-labor for the distance of a far-off caller. The prize

was too close to pass up now. And it smelled something else too, smelling food.

Eggs, those of an enemy. A meal and removal of a threat before they grew to challenge it all at once.

The temptation of the prize had spurred on its courage and it stepped back through the glade, rapidly pacing over until it was right outside the half collapsed pile of branches making up the nest. The other two *Alioramus* were still cautious, but followed their older and more experienced brother.

Ruby tried to resume the call for help, but she was muted by her own labor pains strangling her throat. Panting heavily with puffing breaths, the *Adasaurus* froze stiff when she spied the comparatively enormous pair of bird-like feet standing just outside the nest. Looking upwards, her reflective eyes detected the movement of the raider through the cracks in the roof of the half-demolished nest. How its darkened form, scaly hide on its belly and short feathers across the dorsum, blocked out the starlight in the night sky with pitch darkness. Its shadow passed directly over her face. A sharp snort of its exhale misted the interior with the stench of death, the pointy snout of the *Alioramus* probing between the broken timbers and half rotten leaves. Even with the two clashing giant herbivores having previously damaged the structure, some of the trunks and branches were still holding firm. Many of the sturdy tree limbs were thicker than Ruby herself was, and hardened under the drying of the sun to form a woody defense.

In most circumstances, the raider couldn't get in easily. And even if it tried, the scent of the tarry substance lathered across the timbers marked with various tooth marks dotting their spans would have sent it running in almost any other circumstance. But with the fresh blood in the air and seeming lack of active defenders for the eggs, it was a risky gamble with a big enough reward for the night stalker to take the chance. And the nest having been opened up prior by the battling giants gave the raiders a way in.

Ruby flinched, still shaking in the convulsions and twitches of labor pains, when the pointy rostrum of the raider suddenly wove under the edge of the ceiling and jammed into the open cavity of the nest. It mutely

snorted and sniffed, confirming with smell what it couldn't see due to the angle of its entry. The *Alioramus*' snout suddenly jerked upwards, its mass and horned snout catching on several branches to pry them free of the nest structure and give it more room. If they couldn't break through the hardened tree limbs, they could pull them aside. Ruby would have hissed and squawked, but the jolts of pain from her hips kept her muted.

Breath was trapped in her throat as the memories returned. The stinging phantoms in her arm from having much of her wing plumes wrenched out. The blood rolling down the fanged snout that carried the limp form of her mate's body. The stark yellow in those eyes that chased her through the forest. Out of her original home and now pursued her here. And what had driven them off before wasn't around to do it again.

The egg pushed on further from her, blood from burst vessels and fissures in her skin staining the span of it red. Ruby shivered and pushed, eyes locked upon the open tear in the nest with the snorting jaws less than half a meter away. The giant intruder rumbled a growl and pushed forward, digging their claws into the ground for leverage before thumping the sagging roof of the nest with their snout. Deep thuds soon gave way to splitting fibers and the slide of old wood together. More timbers broke or were shoved aside, allowing the *Alioramus* to shove its face further into the nest.

The egg was halfway out of her now, the raptor quivering and twitching with tensed feathers when the rancid miasma passing out from long jaws steamed the interior of the nest. Those same jaws opened, flashing a row of serrated ivories with strands of drool pulled between them. It was so close that a pair of recurved points pronging the tongue, meant to help score meat from torn sinew and flesh, were visible as they pointed back into the depths of the gullet.

Ruby, unable to breathe clearly, tried to keep her wings across the eggs and shield them from sight. The stout branch which had fallen in front of the hollow from the room was obscuring much of her body from the predators line of sight and stopping the advance of the snout, but upon feeling it in the way the raider doubled-down and pushed on further inside the nest. The long jaws swung forward as the *Alioramus* shoved itself deeper into the structure, wrenching the big branch around and almost prying it out from the woven roof.

The *Alioramus* turned their head and flashed their teeth before biting into the branch, shaking their head back and forth and jerking it about as their ivories sunk into the dead wood. The branch that had been a final meaningful barrier couldn't withstand the mauling alone for long and split. A wood crunch soon followed when the tyrannosaurs' jaws snapped shut with broken wood between them, fragments of the branch spraying Ruby with more splinters.

She shook some off herself in reflex just before catching sight as the jaws parted like a pair of great doors and lunged forward. They repeatedly snapped shut so close to the stilled raptor that hollow clapping of their spans pushed a rush of air from their closing wafted over her feathers. Had she not ducked, her head would have been removed when those jaws bit down on the woody wall above her.

Ruby's body twitched and convulsed, muscles locking up further. Her nerves were on fire and involuntary convulsions coursed through the *Adasaurus*' body. A myriad of preservation instincts screaming inside her mind to run and save herself was in a deathly clash with maternal instinct to protect the nest to the last, with the pain of delivery strangling both to keep her anchored in place as not to properly do either.

Frustrated at smelling what it sought but not reaching it, the *Alioramus* threw its head up in a violent thrash. It banged its head against the sagged roof of the nest as a bludgeon and audibly snapped several timbers. The very thing that compelled it here with such a huge risk was so close and it just couldn't reach or see it! The scent of a great reward compelled its jaws open and body to surge forward, toes digging trenches into the dirt and the whole nest shaking as more of its upper body plowed through it. With nowhere to run, glide, climb, or hide; Ruby's fortress of safety had never felt so suffocated. She couldn't back up, she couldn't run, she could not hide. The jaws she'd run from had finally caught up to take a life in the throes of trying to birth another.

Her shaking body finally reopened an eye and her pulse went cold. Yellow, reflective eyes at last had a direct line of sight into the hollow, seeming staring straight through her as they migrated up from the blue eggs and onto the raptor. The *Alioramus* made no sound, no announcement, no emoting in the slightest as its hot breath wafted

through the nest, misting in the cold night air. In a blink of an eye, it exploded forward with jaws open.

The jaws snapped shut directly above her and it was only by chanced bad aim that they only wrench out several of her head crest plumes and bits of scalp along with them. The sudden jolt and shock of the lunge gave Ruby's nerves shot through her body, fight-or-flight kicking in like it never had before.

Yellow eyeshine from what death itself stared blanked as the neck recoiled back for another strike. Movement shot through Ruby's lower body.

A small, green egg dotted with blotches of dark red; completely different in size from the massive, dull blue-with-black-speckled oblong eggs Ruby had been guarding with her life; at last left her body and pushed up against its larger fellows. The rush of endorphins and freed motion hit Ruby's system in a wave, finally granting her full freedom of motion. Heaving a heavy breath, the *Adasaurus* ducked her chest and neck back to avoid the snapping guillotine that was the *Alioramus*' jaws.

The wet snap and pop of the jaws chomping down on empty air, just a hair's span over her head, rattled Ruby's ears as blood trickled down her face and around her eye from her torn scalp. Several of her head crest plumes previously torn out were still caught in the serrated ivories lining the jaws. The *Alioramus* pulled its head back to re-aim and lunge again, having figured out where their prey was within the nest and not meaning to miss twice.

Fight-or-Flight. The latter had led her here all those months ago. The former was her only option now. One could call it a mother's courage or one of those miraculous instincts in nature, but it was a sight to behold nonetheless.

In a seized instant, the raptor retaliated against her feared grim reaper as she sprung upwards to meet the jaws before they could fully open. Her sharp fangs bit into the raider's nostrils and she seized a hold of the tyrannosaurs' muzzle with her winged arms. The metallic taste of blood splattered over her tongue as her teeth dug lightning into the softer flesh above the nose's quivering tissue. The tips of her clawed hands sunk in to hold on to its scaly hide, and offered a briefest of moments with enough

anchoring to bring her stronger limbs to bear. Her feet, each bearing a recurved talon, were cocked back and brought to use.

*Adasaurus*' did not bear the largest or most impressive claws of the raptor family, but the sickle-shaped stilettos terminating from the second toes of each foot were still quite usable if they hit the right spot. And, young as she was, Ruby had good aim. Swinging her legs under the maw, talons on the inner toes of each foot punctured the softer skin of the *Alioramus*' mandible. The stabbing claws bit through the thin scales, skin, and muscle of the underside of the jaw to spike into the mouth and puncture into the base of the tongue. It would hardly be a dire wound, but it hurt well enough.

The *Alioramus* jerked backwards and upwards, Ruby jamming her eyes shut to push away the stars assailing her vision from getting shaken about whilst holding on for dear life. The raider reared back and thumped its head against the roof of the nest, causing the raptor to grunt through her bite after feeling her back thwack against several timbers with a hearty thud. She retaliated by biting down harder, teeth sinking into the nostril's flesh and creating a river of red crimson into her mouth as she thrashed her head side to side to twist and rip.

The night stalker thrashed and shook its head side to side, bashing its own skull into the interior of the nest more than it was managing to dislodge the very stubborn *Adasaurus*. With her clamped onto their nose and holding their top jaw whilst keeping her feet braced against the lower jaw, and talons hooked into the tender flesh below their tongue, they couldn't open their mouth wide enough to grab or dislodge her.

Feeling its body seizing up to swing upwards, Ruby fought through her delirium to quickly let go of her grappling hold and landed back in the nest to get into position for step two of her ploy. There was an eruption of foliage and timbers when the raider violently burst through the remaining roof of the nest. Twigs, sticks, split wood, and rotten leaves exploded outwards in a broad span. Hissing in anger and surprise, the would-be nest raider's yellow eyes gleamed in the dim night's illumination. Reflective trails of blood trickled from the numerous scratches flanking its face and bitten nose, whilst two punctures in the under-jaw wept even more red ichors down its throat.

Shaking itself free of the debris, the *Alioramus* looked back down at that which attacked it, tilting its head in the manner an inquisitive owl might when weighing a situation as the other two *Alioramus* closed in to see what had happened to their leader, having after initially being startled by Ruby's brazen attack. At first even the emboldened leader backpedaled again, pupils dilating in fright from what it saw and heard.

Green eyes seemed to be glaring back at them, much like those that had driven them off all those weeks ago when they first chased the female raptor into this glade. The thundering had also returned.

Ruby had assumed her threatening stance, both out of instinct to defend herself and another to cover up the eggs as soon as possible. With her head tucked in and chest held low, she fully extended her arms whilst flexing small muscles to fully expand out her wing and tail plumes. The bright green circles on the tail looked the part of enormous, viridian eyes. With her body held the way it did, it made the *Adasaurus*' entire form resemble the head of something big. Something very big with very big green eyes. Something, which made the low rumbling noises she was imitating earlier in tandem with her mimicking threat display.

In the distance, Ruby's bellowing carried for a long ways away due to its low frequency and pitch. A tree's branches rattled and small birds within them retreated into the air. The moonbeams briefly revealed a blur moving beneath the cracks in the canopy.

The *Alioramus* leader backstepped, rearing up to both make itself look larger and to better take light of the situation. It feared no raptor. Even for a moderately sized genus as far as tyrannosaurs went, it far outsized them and it had long since outgrown the brief window the sickle-clawed hunters had to threaten it as a child. Now the roles had reversed and its kind so frequently meant death now for the raptors in the times their paths crossed. But the visage and noises it was confronted with in turn, meant death for it and all other *Alioramus* even at full size. The raiding leader let out a fearful chortle and almost turned to run, had a scent not crossed its nose once again.

Turning back to the nest, it saw and heard the object of its fears, and yet the smell was distinct to disagree with what the eyes and ears told it was before them. It could detect the owner of the big blue eggs and the

territory markers and branches composing the nest, and yet it couldn't smell them clearly. Instead, potentially the most identifying scent of them all, was coming from the trickles of blood seeping from Ruby's body. The scent of the non-threat it had detected before, the scent of potential prey like the male raptor it had killed some months ago. That this was that male's mate never even factored into its mind, sensibilities like that were lost in nature. In simple, animalistic deduction; the scent of wounded prey pretending to be a predator she wasn't.

Ruby's eyes dilated upon seeing the towering raider no longer retreat, especially when its two companions formed up alongside it. Instead their lean form strode forwards again, eyes locked upon her and the brood. The lead *Alioramus* warbled throatily, tensing its body and readying to pounce. It had come for the eggs and knew exactly where they were now, a snack like Ruby was a welcome side benefit.

On the edge of the glade clearing, a tremor rolled through the ground. An enormous, three-toed foot stepped into the massive track Ruby and the *Alioramus* had passed over earlier. Only this time, the foot fit the print perfectly before it bounded off the ground at surprisingly high speed. Something was dropped, a great mass of bloody and fang-torn flesh that used to be some large animal's corpse flopped onto the ground. The torn-off limb's staining blood ran over freed up rows of ivories brought to bear whilst the giant's forward momentum increased.

One of the subordinate *Alioramus*' heads perked up, detecting something and swiveling their heads to the forest to try and figure out what it was. Their leader didn't notice, eyes still trained on their prize at the eggs and their meager guardian. They took a step forward, hackles of feathers raising in agitation.

Ruby tensed, legs ready to spring and her tail fan swaying in anticipation to get ready and dodge or resume a fruitless attack now that her bluff had failed. The leader *Alioramus* hissed, arching backwards and taking light of their prey. The raider of the homestead wasted no time and sprung out like a coiled spring, swinging downwards with jaws spread wide open whilst aimed at the stubborn *Adasaurus*. The drool lathering its lips and flicking off into the air with its motion. One of the subordinate *Alioramus* squawked a shrieking cry of alarm that went ignored.

The leader of the raiders lunged for Ruby just as she jumped to try and dodge and perhaps brazenly attack. Jaws slammed shut.

Something cracked, the audible crunch of bony tissues sliding and snapping under strain. The largest of the *Alioramus* trio froze in place for the briefest instant, eyes snapping wide in shock, before jolted by the pain to snap and thrash its whole body in a bid to get free. The other two members of the pack bolted aside in opposite directions, trying to get clear of the massive form that had managed to sneak up on them despite its huge size and rapid approach.

Truly enormous jaws that had seized the raider by the halfway point of the tail held firm, before a roll of the torso and snap of the thick neck caused the whole body to crack the *Alioramus* like a whip. The raider was violently yanked aside and hurled several meters back. It crashed down to the forest floor in a scattering of leaf litter and dirt. Squawking in pain whilst rolling across the ground away from the nest, the *Alioramus*' tail was bloodied and bent from breakage along the spine.

Flopping and writhing about on its back, it nearly doubled over end over end before sliding to a stop. Barking in its breaths, the *Alioramus* pack leader was in full panic as a shadow crossed over its body to block out the moon. The horned tyrannosaurs' clawed feet kicked back and forth to try to both keep its attacker at bay and get back to its bearing to counter or threaten whoever had attacked it. Even if it attempted the latter, it would almost certainly not work; for the behemoth that had ambushed the hunter was easily four times its mass and knew it.

A massive foot, like a bird of prey of enormous magnitude, stomped down upon and constricted the *Alioramus*' chest in a pressuring grip. A gasping rush of air shot from the night stalker's jaws from its chest being pushed inwards, forcing its ribcage to compress.

One of its packmates, the large female, attempted to save their leader and sibling, charging at their attacker and nipping at the scar laden skin at the giant's flanks. But the moment her teeth hooked into the pebbly scales at the base of the tail, the entirety of the extremity swung in her direction. Like she had been smashed into by a falling tree, the crashing wave of flesh and bone sent reverberations rattling through the *Alioramus*'

ribcage and body with the tail smack. Knocked off her feet, the stunned nest raider was sent sprawling with a yelp escaping her gasping jaws.

The third of the *Alioramus*, the smaller subadult of the two remaining pack members, was coming about from the other side to either mock charge or try to get at the neck whilst their attacker was distracted in the other direction. Thick muscle, visible under the feathery mane spanning the throat, rolled. Visible even in just the moonlight and with the eyes shadowed under a wide brow, piercing green glared from behind enormous jaws after the head quickly darted in their direction to face the youngest raider.

Just the sight of that enormous head turning to look at the subadult raider instantly killed all bravado in the moment, that emerald hued glare shooting right through them. Afraid of the harm that would surely befall them getting so close to their attacker head-on, the last of the *Alioramus* still on their feet skidded across the glade floor as they frantically reversed their momentum with rapid backpedaling. The attack was averted before it even got the chance to land as the *Alioramus* tried to get as far away from that glaring gaze as possible.

The pack dealt with for the moment, the giant turned their focus to the subject pinned underfoot.

Bloody, serrated ivories were borne in the row of teeth lining meter long jaws. The newcomer's visage was quite similar in shape to the *Alioramus* itself, but clearly of a different breed. Fangs and jaws, which were broader and larger by an order of magnitude, parted to release the sound of thunder from their lungs. The entire forest vibrated and trembled.

The comparison to a storm was not just in volume, but in sound itself the call of the irate giant could be mistaken for the clap and drumming of thundering heavens as it flooded the lands for miles. The air itself rattled and vision blurred constantly from the outcry bellows both perceptible and imperceptibly low to a human ear; whilst bordering on deafening to all of those in earshot. Below a ridged brow, they bore a striking dark emerald hue in their glaring gaze, from both the comparatively tiny eyes themselves upon the huge head being green but also the colorized skin surrounding the socket which enhanced the visage.

Despite a magnitude of difference in volume, the loud bellow carried within it the same undertones and flow the *Adasaurus*'s threat display call had so faithfully emulated. Rolling thunder blended with the throaty roar of what sounded like the biggest crocodile in history.

In general form, the newcomer did closely resemble the *Alioramus* in more than just their fangs and jaws. Long of leg but short in arm, with a massive tail and head. But the comparison was like putting a bobcat next to a tiger when contrasting the *Alioramus* to their giant attacker. Reddish bronze in general color with blotches and stripes of tans and blacks, the body largely bore small scales covering a majority of its form save for a few places. Those exceptions were the plated scutes adorning the snout and feet, the knobby bosses of keratin above each of its brows and top of its snout to form raised ridges. A cape of thin, burnt gold feathers lined the dorsum down to a tuft tipping the tail. Ivory hued teeth flashed with the opening of jaws, sheathing lips sliding to expose them as the whole body vibrated in the reverberations of another overpowering utterance.

*Tarbosaurus*, a name that fittingly meant this avian dragon invoked equal parts awe and terror. A healthy adult male, a drake, in his prime; the flesh eating giant was eleven meters from nose to tail and over three meters tall, with his muscular legs bearing a mass of over five thousand kilograms. Drool and blood of prey rolled down the contours and canyons of the aged battle scars etched onto his face. Some old wounds from snapping serrated jaws, others slashes from long-clawed arms. The fully mature drake had seen plenty of conflict before from the likes of things far more ferocious than this raider less than a fourth his size. *Tyrannosaurus rex*'s predecessor, this was the largest apex predator that the largest continent had ever seen. And the drake was mad.



### **The Wrath of Khan**

*Tarbosaurus vs. Alioramus* by Sumair Ferhan Syed

A gasping wheeze came from the *Alioramus* pinned underfoot, some of its ribcage giving under several tons of weight pushed down onto it to fracture ribs and splinter cartilage. One of its companions, the one previously sent back with just a glare, resummoned their drive and attempted to intervene with the brief distraction and desperation to save their brother igniting bravado. Attacking as a pack meant they could attack as a whole, flanking and striking from multiple angles whilst the more dangerous parts of a larger beast were occupied and pointed in another direction.

It worked decently well on four legged herbivores, which were slower to rotate and redirect to face an attacker; leaving one hunter to go for the flanks or legs whilst another got their focus. But physics changed with stance, and if one was expecting the *Tarbosaurus* to turn about as an elephant of the same size would, they would soon be in for an alarming lesson. After all, the larger predator wasn't entirely acting on the defensive either.

Stepping on and off the pinned *Alioramus* to barrel forward, the *Tarbosaurus* drake suddenly pivoted on their foot and snapped their body around. Their momentum of the forward charge was maintained and redirected. The attacking *Alioramus* didn't have time to dodge before the larger tyrannosaur bulldozed into it, having lowered its head as a battering ram and bashing the intruder across the midsection with the thick bosses above its eyes contacting the chest. The meaty crunch from the impact indicated broken ribs, the force having been like getting hit by a truck.

Not stopping, the drake swung his enormity of a body upwards and opened his jaws. Ivories of fangs were exposed before snapping shut across the *Alioramus*' back, carving through feathers and scales alike. The subadult *Alioramus* barked and squawked in painful alarm as its feet left the ground. Thrashing as it may to try and free itself, it only succeeded in sinking the fangs further into its hide and muscle. Grasping the intruder across the hips, the *Tarbosaurus* drake lifted the smaller tyrannosaur off the ground and shook its whole body back and forth. Fang rent flesh and blood was thrown across the ground, as those enormous jaws clenched down harder and harder to squeeze tissue and scrape bone. Had they a moment longer to act or had been clamped down on a more vital spot like the throat, the *Tarbosaurus* could have crushed them to a near pulp.

Instead, he opted to not linger on one target as there were multiple foes afoot and something vulnerable in danger. Shifting their full weight backwards to keep balanced as they hoisted the *Alioramus* a full meter or two off the ground, the *Tarbosaurus* snapped his head aside and opened his jaws.

The full mass of the raider who once seemed so huge compared to Ruby was sent hurtling across the ground, almost ragdolled as it was sent rolling end over end across the glade in a heap. The *Tarbosaurus* stomped after the smaller predator, almost charging the female packmate who'd been bowled over by the tail smack earlier before quickly redirecting to target the downed raider again. The irate drake raised a taloned foot and kicked out upon closing the distance. The bloodied *Alioramus*' eyes dilated in shock that cut through its daze. It jerked itself aside and it was only by that miracle of reflex that the raider avoided getting its neck stomped on. The *Tarbosaurus*' foot came crashing down

as a sledgehammer, blowing back dust and debris from the force of impact.

The female *Alioramus* had managed to circle around after ducking the drake's mock-lunge, and threw herself at her smaller brother's attacker. Moonbeams reflected off her tightened muscles as she sprang. Jaws were opened wide and clamped shut, neatly serrated fangs managed to bite into the fine mesh of tiny scales and the tough muscle beneath. Latched onto the *Tarbosaurus*' leg, she stubbornly thrashed and pulled, trying to yank back and use her agility to get clear.

In some respects, young *Alioramus* and *Tarbosaurus* resembled one another more than their adult forms and dined on similar swift prey. But the divergence of family was self evidence when maturity took hold. The thin, agile jaws of the former were ill equipped to hang onto, crush, and shred into the girths of armor, muscle, or stocky builds of big game. Blood was drawn and the drake felt pain; but he wasn't especially hurt.

Agility and numbers could always help a hunter, but there was a good reason size often did matter in nature's rules of engagement. When the hundreds of kilograms of *Alioramus* was in a contest of who could pull who against several thousand kilograms of *Tarbosaurus*, it wasn't much of a contest. And the drake had been in a lot more confrontations than the horned raider had.

Anchoring himself into the ground, the *Tarbosaurus* abruptly threw his mass into a sharp shove and rotation to the side. The *Alioramus*' eyes widened as her jaws were forced wider from the leg getting pushed into the back of her maw, unlatching from the bite as her feet tried and failed to keep her grounded. The tail of the *Tarbosaurus* shadowed the glade, passing over Ruby's hyperventilating face as it swung wide. Rotating his whole body about, the *Tarbosaurus*' sheer bulk wrenched the raider off her footing and knocked her backwards.

Ignoring the trails of blood from the bite wound, one of the largest predators Asia had ever seen wasted no time stomping off after their foes. The bitten and thrown *Alioramus* had awkwardly scrambled to his footing with a stagger and limp, with his larger sister soon desperately trying to do the same whilst dodging another charge by jaws that seemed

to be trying their best to bite her head off. Despite his bulkier body and form, the drake was agile enough to press the attack on both of them.

Behind the attacking giant, the previously stepped-on lead *Alioramus* managed to stagger to their feet. Yellow eyes of the raider wobbled in their blurry sight, briefly turning to consider the nest and the whole reason for doing this dangerous venture. It had been a big risk for this exact reason of a *Tarbosaurus* showing up, as they rarely left their nests alone for long. Even in a pack, the ridge-crested *Alioramus* stood little chance against a healthy adult apex predator in a confrontation, let alone an actual fight. The best option for their safety was to avoid the adults and potentially cull the juvenile *Tarbosaurus* if they got the chance. Smaller the easier, especially in their eggs.

Larger predators hunted smaller predators as adults, and smaller predators sometimes hunted the young of their future cullers for the sake of their own kind and young. It wasn't anything personal, vile, or cruel; such concepts were unknown to them. This was just nature in a form as natural as Ruby had been guarding her nest. And nature rarely demanded needless conflicts. The lead *Alioramus* briefly locked eyes with the still vigilant but exhausted Ruby, but only for a moment and without anything resembling a connection between them. The killer of Ruby's mate quickly limped off to the forest, regarding the *Adasaurus* still in the nest no more personally than it might regard a random tree in the woods.

Its two younger and less experienced companions were still frantically trying to fight back or, more often, just get away from the irate *Tarbosaurus* drake. The larger predator would at times mock charge one, only to redirect and lunge for the other. Despite its huge size, the drake was still so deceptive in how nimble it was and could not be outflanked any longer. Step by step, attack by attack; the *Tarbosaurus* acted with aimed intention. The distance between the invaders and the nest was growing inversely with the span separating them from the treeline.

The smaller sibling raider managed to stagger to his feet after being sent rolling through a line of shrubs, tearing through the bushes and ferns in his frantic flailing to get righted. The last of the pack desperately tried to bite down on the *Tarbosaurus*' comparatively tiny arms, more out of desperation due to not having time to fully dodge another charge than

actually trying to fight. Pivoting up on its opposite leg, the giant tyrannosaur cocked back and kicked out with one of his feet.

Air was sent gasping from the raider's jaws as the broadside of the drake's foot impacted the *Alioramus*' gut and launched it several meters. Blunted by gripping the ground for traction as they were, the claws tipping each of the *Tarbosaurus*' toes did manage to carve shallow gashes in the lower belly of the attacker. That and having the wind kicked out of their chest was more than enough to send the terrified raider scampering off to the forest to join her elder company.

That second threat dealt with and seeing neither of the two who'd fled circling back to the nest, the drake's green eyes directed themselves upon the final *Alioramus* which had just regained their footing. The raider's bloodied feathers bristled from tightened skin, with chuffing barks and hissing breath between the young male's gnashing teeth made less as a threat display to a combatant and more a desperate bid to keep the *Tarbosaurus* from charging and mauling them. Their show was quickly silenced by a single, sharp sound.

Standing between the final intruder and the nest, the drake repeated the threat. The deep, reverberating, hollow wet thwack of the *Tarbosaurus* snapping his huge jaws shut in a gnashing of the air. Several more times the jaws, a mouth big enough to engulf the *Alioramus*' whole head with room to spare, snapped shut with deep, hollow thumps.

It was as much a show and communication as a panther growling or dog baring its teeth. A clear show of force and what was going to be brought to bear in a moment.

Each bite could be a killing blow, and it certainly killed any of the younger *Alioramus*' resolve that remained. The giant species of tyrannosaur was simply too big to consider opposing, even if it had backup. The best option for it was the same option a wolf might rely on to survive under the territory of a tiger, a lesson in strategy its elder had learned prior and it did now in how to deal with a large predator.

Be somewhere else.

The one way it surpassed the angry drake was speed, and even then just barely with its wounds. A fact that it was reminded of when the final

*Alioramus* turned tail and ran off into the forest, the irate *Tarbosaurus* still snapping and sprinting after the raider's bloodied back that bore his teeth marks. Stomping footfalls echoed through the dark forest long after the clash of the tyrant reptiles had ceased.

Ruby's body ached in every joint and nerve. The raptor limped back into the nest, heaving for breath and still seeing stars in her exhausted vision. The cold of the night was one of the first senses to return to the brave young mother, and with it came that strong instinct many mothers had. She weakly hauled herself back onto the eggs fully, both her own and the others, using her thin snout to gently turn them over and push them back together. Her little green egg now nestled amongst the rest of the brood, alongside the much larger blue speckled eggs.

The *Adasaurus* mother flexed her belly feathers upwards to expose some of the skin of her stomach, putting the warmth of her body directly to her unhatched family. Wings were carefully wrapped around the brooded clutch, helping keep the heat in. With the nest's walls and roof all but destroyed, all she could do was tiredly lay down and hope to heat the eggs and herself with her feathery body. Pulse slowing down, sleep and exhaustion took her soon as the snowflakes began to fall over her numbing form. Eyelids grew heavier and heavier until the herculean effort of keeping them open was too much.

## Chapter 6 - Daybreak

A quiet rumbling roused Ruby to awareness. It was telling of her prior wariness and keenness of instinct that she slipped awake almost instantly, in spite of her numerous wounds and fatigue. The night had begun to pass, the very edges of sunbeams starting to redden the early morning sky. Snow that had accumulated upon her body flecked off with her shiver and shake, frosty dusting remaining on her feathers as her eyes slid open. In an instant there was a scent of blood and rot which permeated the air, wafting in with the breezes of hot, musky scent that pushed back the cold of the frost.

Looming over the corpse of branches and foliage which had once been the nest stood two gigantic columns of legs. Each terminated in three-toed feet bearing a tiny fourth dewclaw and looking all the part like those of a gigantic bird, tracks left behind the enormities having punched trident shaped impressions into the ground under their mass. Depressions exactly like the one Ruby crossed heading back to the nest after her brief hunt the prior morning.

The lord of this domain had returned to their abode. A gargantuan head, heavier than Ruby herself multiple times over, lowered down to hover just above the ground. The seam of scaly lips parted, the dim light of the early sun glinting off the wet blades that composed the ivory teeth sheathed behind them. Dried and dampened blood both stained the fangs, flavoring its breath with the potent odor of decay. It could have been one of the *Alioramus* had been caught and slain, or it could just be remnants of a prior hunt.

Hardly mattered, his intent to drive off the pack had been the priority and the drake had continued chasing them a long ways. Twice now they'd intruded and he was keen to be sure they would not come back.

Ruby inhaled the rotten smell again, similar to the *Alioramus* pack leader's essence but a breed different. What irony it was that which previously was the scent of a harbinger of death could now mean life, even in a form so similar. But if a huntress like herself, a taker of life to sustain another could mean a continued existence of life for her family;

then such ironies made sense. As a part of nature she didn't identify the world by good and evil, just threat and non-threat. And the latter had at last returned.

That piercing, rarely blinking stare of the *Tarbosaurus*' green eyes and the skin around them bore into her. The tyrannosaur drake tilted its head slightly to the side, emerald hues wide and still. It leaned forward slowly and closed its jaws. The flat of his rostrum prodded Ruby along the shoulder, a low, thunder-like rumbling coming from the back of his throat. An identical call seeped from the gut of the *Adasaurus*, synchronizing with its partner. Ruby lifted and folded out the fan of her tail like a banner, the bright green spots on it identical to the *Tarbosaurus* drake's eyes.

If he was the apex predator of the region, the king or Khan; she was his flag bearer. And just as she, for all her keenness of bite, skillful of leap, and sharpness of claw meant life itself for her charges; so too did Khan's strength of jaw, might in size, and greatness of power mean life for her. Two carnivores, contrasting in so many ways, were unified in aspects of their devotion to family. And their species were both just as sharp of wit as they were in fang to strike an accord to their mutual betterment.

One was reminded of how their symbiotic alliance had its benefits when Khan turned aside to the nest as Ruby's wary eye spied the object the tyrannosaur had been carrying back to the nest site. He'd dropped it so he could engage the intruders with his full indignation. The bloodied and ripped corpse of an animal, roughly the size of a large ox when compared to modern forms, was still steaming in the chilly air from remaining heat. One limb had already been torn off and consumed entirely, opening up the inner cavity of inviting viscera and the softer meats surrounding them.

Ruby's feathers stuck up excitedly and her eyes dilated in a quickened pulse.

Taking a moment to roll some remaining foliage and mosses atop the eggs to retain the heat, Ruby's legs shivered as she stamped in place slightly with a returning vigor that ignored her wounds. The raptor glanced sideways and received a low grunt from Khan, who was busy pushing some of the broken and torn-out timbers back to the nest to start

repairing the damage. Stress voided her body and the *Adasaurus* jumped and bounded over to the carcass. She literally dove into the buffet, endorphins and contentment pushing away lingering pains from her shoulder, scalp, and arm. Unlike the bloated corpse at the river, the numerous bite wounds and tears made it so easy for her to saw her teeth into the comparative mountain of meat to sample the most tender portions within.

If animals could conceive of such notions, one might have thought the nutrient filled liver she pulled out through the opened chest was the karmic reward for the trials and tribulations the homestead defender had gone through in the last day and night. But such sentiments were lost in nature, she was only eager to further enjoy her symbiotic bond and at last fill her belly in safety. The quicker she was back to full fitness, the quicker she could better defend and foster her coming family.

After all, her kind rarely laid just one egg and she felt another contraction within herself already.

Khan took a moment to survey the surroundings of the glade, rearing upward to offer a higher vantage point with his horned brow on level with the canopy. The nest guardian and incubator had done her job, the scent of what had gone on here was testament to that. An invading pack of raiders, other raptors, and a pair of long-clawed giants even he needed to be careful around, that was bad company if there ever was any. The *Tarbosaurus* would patrol again soon to make certain that cantankerous river dweller, whom he'd had stand-offs against before in the past, didn't return here. That was for later though, he'd only begun his duties.

Stepping over to the treeline, the *Tarbosaurus* drake bit down on a low hanging branch. A twist of his neck and tug from those powerful muscles spurred the wood to bend beyond their flexpoint. Snapping off several timbers, he dragged them back to the nest and began the work on repairs, knitting the branches back together. It was hardly his first nest and his own father had demonstrated it to him well, it had been the tyrannosaurs' memory and instinct which crafted the nest which had held up under so much abuse. And the sooner the structure was dened and refurbished, the better. Winter's last vestiges would be over soon, and that meant more company.

## Epilogue -

Months later, a new daybreak and new opportunities drew in with the rising of the sun's rays. Stepping out of the glade, the broad back and tall form of Khan silently slipped down well-worn game trails to shade the undergrowth in his span. And soon to join into that shadowed protection, where being next to the largest predator on the continent ironically meant it was the safest place for them, a line of smaller forms followed suit. Initially at the head of the pack, Ruby stopped trotting alongside the *Tarbosaurus* drake, pausing and stepping aside.

Pacing up behind the one they saw as being like their mother, a quartet of dinosaurs caught up to and passed by the *Adasaurus*. They were already almost half her size, and would soon exceed it in a few months perhaps. Ruby watched and counted each as they passed her by. Bodies covered in brown, downy feathers to keep them warm; with youth indicated easily by their oversized paws and proportionally big eyes. Not nearly as bulky as their sire, they were growing up in length and height far faster than they were in bulk. They'd remain that way for upwards of a decade, becoming long-legged sprinters instead of ambushing bruisers like their adult kin. For now however, they were still just hatchlings. All four bright green in gaze, they certainly took after their father well.

The last of the juvenile *Tarbosaurus* stopped and looked at her, before chirping and eagerly pushing up against their nest-nanny. Like that, the gates were opened and the chick's siblings promptly about-faced and ran to Ruby. The playful mob chortled impishly as they rubbed up against the raptor to either keep more of her comforting scent to them or perhaps beg for some extra food.



### **Ruby's Triumph**

*Adasaurus* and *Tarbosaurus* hatchlings by Sumair Ferhan Syed

Ruby gave them a light nip to coax the young tyrannosaurs back along to catch up to their father, turning her attention to the trio of even smaller bodies waddling up behind their siblings by different blood. Near identical in color to the baby *Tarbosaurus*, the three *Adasaurus* chicks' downy fuzz and lanky, childish proportions made their still growing-in, future wings look almost comical. Still, despite being half the size of their nestmates, the clutch had the eagerness to keep pace and hurried after them. A few even playfully mobbed the young tyrannosaurs, the mixed flock tussling and nipping at one another in brief games of chase. Practice for the skills they might use years later, to go along with the instruction by example their parents were bringing them along for.

The children's first night outside the glade, a time to teach the next generation to give them the best odds to grow up and teach one night themselves. How to survey, where to drink, what trails to use or avoid, how to hunt, what calls to use, how to avoid a fight, and how to fight back if they must.

Ruby clicked her jaw and shook her feathers, tensing back up to keep watch for dangers by being at the rear of the convoy. Stepping out of the homestead and into the forests to join her family, her eyes, ears, and nose were already working trying to figure out whom or what they might run into tonight. Be they food or foe, familiar or unfamiliar.

This world wasn't always a horror show, but it could be harsh in equal measure to how it could be pleasant. Some wouldn't make it to experience the things their parents had. But life always carried along its way, sometimes finding new and inventive ways to tackle those trials. And who knew? Perhaps in a decades' time when one of Khan's children found a mate and began their own clutch of the next generation; one of Ruby's own or their own children might be right alongside them.

As it had been for thousands of years, and would be for millions more. In the stories within the times before history.

# THE SCIENCE -

The point of this story wasn't to definitively say this is *exactly* how life in the past played out in this specific instance, but to show a possibility less explored. Behaviors can be extremely hard to distinguish definitively from fossils, and while some indications can certainly be pretty ironclad; others will be vague.

For example if we find the fossilized young of an animal buried within a nest, food that had been brought to the nest, and a fossilized adult buried nearby; we look at the modern animal kingdom to see what circumstances would lead to this. We see this sort of interaction in various birds where the attentive parent brings food back to the nest for the young to eat as they grow. By contrast, animals which are independent from birth, like most lizards and turtles, have the young leave the nest almost immediately with little to no parental care. So in all probability, this fossil animal discussed had its childhood more like birds than lizards.

Other behaviors implied by fossils however, might be more guesswork with multiple possible explanations. Find the tooth marks of more than one carnivore at the site of a dead herbivore? That means more than one predator ate from the carcass before it fossilized, but the specifics are hard to gauge past that.

Does it mean they hunted and ate together in a unified pack, like wolves so often do?

Or might it be several typically solitary predators banded together to attack a target of opportunity in an unorganized mob, like Komodo dragons sometimes do?

Or did they even attack all together at all and just fed on a carcass left out in the open over the course of several days, like random scavenging bears?

It can be very hard to prove the herbivore was even killed. In the wild, animals die of diseases, accidents, starvation, or any manner of causes beyond being directly killed. Sometimes direct evidence of predation does exist, like a healed bite wound on a prey item which was attacked but managed to get away. This can show us the carnivore was indeed a predator, and like all predators it had successful or failed hunts, but it can be tricky to tell if it was social or not for the prior-stated reasons.

This means speculation must be done with a grounded basis, and the speculated behavior must both make sense for the biology of the animal involved and perhaps be based on the modern animals who either might be related to it or are exhibiting similar behaviors. Doing this is the difference between grounded speculation and just guessing, regardless of if you are hypothesizing about pack hunting, child care, mating rituals, or other life ways.

The short story you have just read was meant to use such grounded speculation, while still telling a fun narrative. If the animals are behaving strangely as opposed to expectations, that's because I intentionally picked some behaviors seen in modern animals that aren't often shown in the media using prehistoric animals. Media using dinosaurs and other prehistoric animals often falls subject to certain tropes and imagery that get repeated again and again. Some of these aren't impossible and might be based on real evidence, like *Tyrannosaurus* and *Triceratops* getting into confrontations, but animal life is more complex than just a few popular images and assumptions.

Raptors are subject to a lot of these assumptions and I thought to give a different interpretation than most have. So, let's talk about the protagonist.

# “Raptor” Exposé



*Dromaeosaurus albertensis*, the archetypal “raptor” for whom the scientific designation of the group, Dromaeosauridae, was named (Public Domain)

Clear your mind and think of the word “Raptor”. Now, assuming you didn’t think of a bird of prey or a fighter jet, what did you imagine?

A scaly, man-sized, sneaky predator who is the fast running, smart minded, alpha of a pack and potentially tries to eat Jeff Goldblum or Bryce Dallas Howard?

Or are you more paleontological minded and thought of these predators by the scientific labeling, Dromaeosauridae (“Running Reptile Family”, named for the first well documented species, *Dromaeosaurus albertensis*), and imagined feathery ground-hawks of various sizes?

Since the early 2000s a lot of documentaries have managed to get the look for raptors right, and Hollywood only recently started to finally catch up. But even if their look is now far removed from 1980s look for the *Deinonychus* (retitled *Velociraptor*) of the film and novel, *Jurassic*

*Park*, the thought of these being extremely intelligent, pack-hunting speedsters seems too fun to not use.

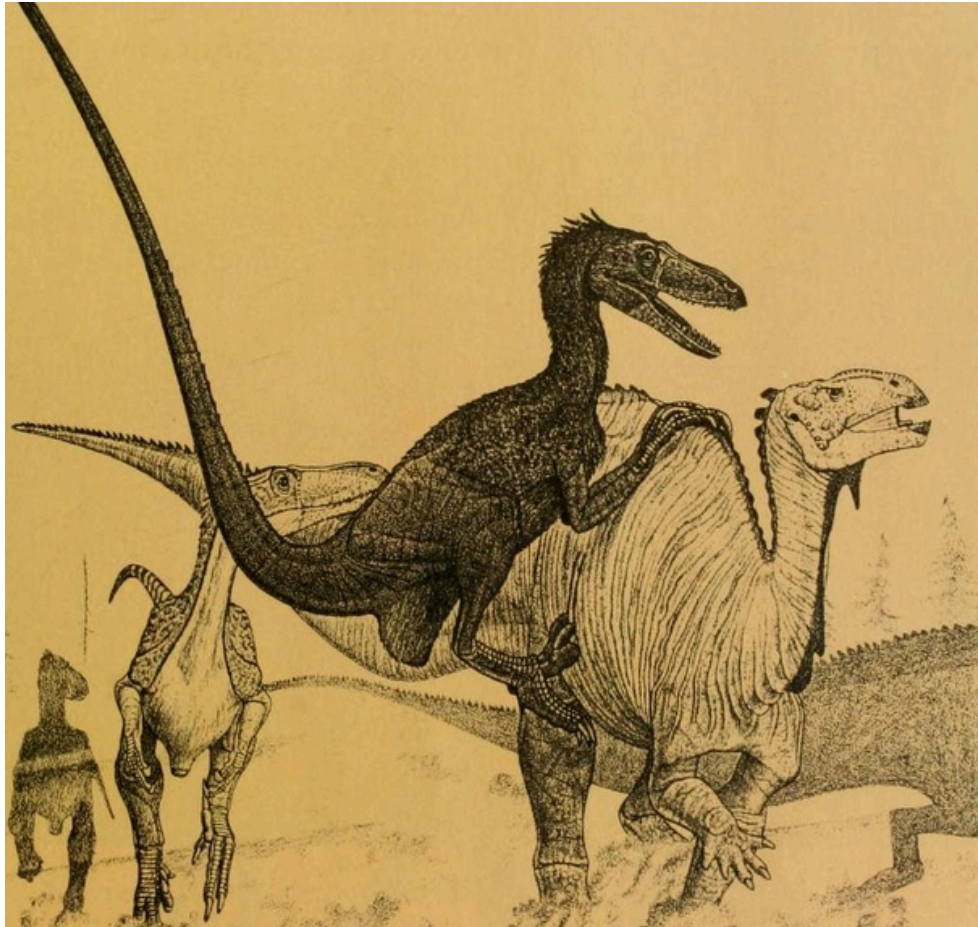
Surely, with their lean builds and sharp, hooked claws these were the dinosaur version of- nay- the *improvements* over pack hunting wolves! True enough some fossils can be taken as evidence that at least some raptors were social. There are fossilized trackways from China, with multiple individuals moving in the same direction at the same time, and a predator trap in the USA with the largest of all in the sharp-clawed family, *Utahraptor*, with individuals of various ages who got trapped in muck together.

This notion of pack-hunting, super smart raptors goes back to the dawning of the group's infamy. While earlier species had been discovered, it was the 1960s-1970s discovery and study of the roughly jaguar-sized *Deinonychus* that spun this idea. Discovered and named by Dr. John Ostrom in 1964 and studied extensively in the years after, *Deinonychus* was not only the largest of its group known at the time but it also seemed to have indications of things unknown to dinosaurs at the time. Evidence for brooding behavior, with an adult nesting on its eggs like a bird with body heat, brought back long-since discarded theories that dinosaurs were endothermic ("Warm-blooded"), active animals like birds.

Other signs of behavior were also investigated. Alongside recovered *Deinonychus* teeth were the remains of a larger, herbivorous dinosaur called *Tenontosaurus*. As the number and size of the teeth indicated multiple individuals fed at the site, this was taken as an indicator that *Deinonychus* could have hunted in packs. After all, a small mob of 50-100 kilogram predators stood a better chance at felling a 500-1000 kilogram herbivore than alone. And surely the long, sickle-shaped claws so endearing nicknamed "killing claws", were how raptors gutted and disemboweled their prey! Other authors took this idea and ran with it, featuring pack-hunting raptors in almost every ensemble book that showcased the variety in the Mesozoic world.

And when Michael Crichton penned his most famous novel, *Jurassic Park*, what had been codified in the pages of paleontological hypotheses and books was put out for the world to see in his bestselling story. Especially when he and David Keopp wrote what became the then

biggest film of Steven Spielberg's career sometime later. After all, let's remember that it was *Deinonychus* that was the template for the raptors of the island theme park, not the actual *Velociraptor*.



*Deinonychus antirrhopus* (called “Velociraptor antirrhopus” in the book) attacking and savaging a *Tenontosaurus tilletti* with disemboweling claw slashes, how raptors were typically seen at the time. (Gregory S. Paul's *Predatory Dinosaurs of the World*, 1988)

So open-and-shut-case right? Raptors were social living predators and targeted big game. It's a certainty... right?

Except, nature doesn't work that simply. Name a pack-hunting carnivore. Go ahead, imagine one in your mind right now. Most often it would be wolves, lions, spotted hyenas, or maybe for the more exotic one you might have picked an orca or Harris's hawk. For the sake of simplicity, we'll go with the lion.

Lions live in prides composed of mostly females with a few males, and the lionesses especially often work in teams. So if any raptors had

indications of group hunting or pack living, it makes sense to model their behaviors on modern pack hunting predators like lions, right?

Consider the leopard spotted in the room.

Leopards and lions are extremely closely related, enough that young lions often have spots that fade with age and the two species can even crossbreed on occasion. The two have very similar bodies and methods of living, hunting included. Aside from experts, most people would have a hard time telling a leopard skull from a lion skull unless they could see the size difference and extremely subtle details. There is more in common between a leopard and a lion than there are between various dromaeosaurids like *Deinonychus* to *Adasaurus*

But leopards don't hunt in packs. Neither do other types of panthers like jaguars typically pack hunt. Outside of rare fluke occasions, felines in general do not hunt in groups but are solitary predators. The same could be said for virtually every type of social predator which are outnumbered by their solitary cousins. Just because lions hunt in groups doesn't mean their close relatives do, so we can't instantly assume all raptors hunted in packs if a few types did. Instead there is a size trend in relation to group hunting that can give a clue.

Which type of carnivore tends to pack hunt more often, big predators or little predators? Most would assume the small predators do, but look at the general trend.

Harris's hawks hunt in flocks, but smaller Cooper's Hawks chiefly hunt solo.

Spotted hyenas hunt large prey in clans, but smaller brown hyenas chiefly hunt solo.

Wolves hunt big game in packs, but smaller jackals and foxes chiefly hunt solo.

One can't paint a whole group based on the behaviors of a few, not reliably. For every social predator that has ever lived, there will be many of their cousins, often smaller ones, that are solitary or only hunt in mated pairs. The only raptors with good evidence for pack hunting are the biggest of their kind, which is one of the few norms in nature for predators. As appealing and dynamic the image of multiple Davids

bringing a Goliath low is, in the wild it is the *big* carnivores that pack hunt often, not small ones Nature is very rarely “brains vs. brawn” in predators.

It makes sense after all, a predator typically needs sufficient size and strength to actually seriously wound a big prey animal; and the added size can help a hunter shrug off a hit if the prey fights back. This is why we see multiple 30-70+ kilogram wolves attacking bison, and not roaming hordes of 5 kilogram foxes. Exceptions do exist as plenty of large predators are chiefly solitary, such as in the case of bears and tigers, but in general pack hunting is found more often in the larger members of a group instead of the small bodied ones. And even that isn't entirely constant as tigers will also occasionally form coalitions to hunt together.

Now this rule is not hardened so much as to not have exceptions as some small predators like South American bush dogs and North American coyotes can hunt in packs as well. But in many of these cases, they are still among the larger predators in their regions and/or are exceptions to the rule. And in both cases, these animals are not necessarily apex predators as coyotes fall prey to wolves, bears, and puma in North America; and bush dogs to jaguars, puma, caiman, and anaconda in South America.

Currently, the best evidence of raptors of any breed being social all comes from the species which were the absolute *biggest* of their group, huge outliers compared to most. As mentioned earlier, a slab of stone recovered in 2001 by Dr. James Kirkland and his students, which is still being studied today, seems to show multiple *Utahraptor*, the largest of all dromaeosaurids at roughly the size of a record polar bear, all buried together.

Some were from different age groups, which is what we'd expect to find from a social pack animal with members of the pack helping raise the younger generation. Wolf packs are this exact type of structure with the “alpha” pair not being really alphas at all, but the mother and father of the younger pack members who live with their parents to help raise their little brothers and sisters. Other explanations exist, but the possibility this was a pack (or family) which died in a natural trap like a mud pit remains most probable.

In 2007 a study by Dr. Rihui Li and their colleagues was released detailing a fossilized trackway found in China. The tracks showed several raptors of very large size, comparable to *Utahraptor* and likely of a similarly sized animal, moving in the same direction, with the paths reacting to the presence of one another in a way that implied they were moving together in a group.

However, it should again be noted these finds are nearly exclusive to the absolute *largest* members of the family. And the biggest raptors are several orders of magnitude larger than the likes of the man-sized *Deinonychus* which inspired the *Jurassic Park* raptors, let alone the coyote-sized *Velociraptor* and wolf-sized *Adasaurus*.

Even *Deinonychus* is not immune to this second look. While it is still possible that *Deinonychus* indeed hunted in packs, being objective about the evidence leaves a vague possibility. There are teeth from multiple *Deinonychus* feeding on a dead herbivore, that is what is known. But did they hunt it together in a pack? Or might have only one large raptor managed to fell a herbivore far larger than itself, as some big cats so often do; with the rest just scavenging off the kill after the hunter had their fill? Did the *Tenontosaurus* die of other causes like disease, drought, or accidents and the raptors had no part in its demise, only the dismemberment of its carcass? Larger predators also lived in the same formation, such as the multi-ton *Acrocanthosaurus*. Might have one of them actually killed some of the instances of dead *Tenontosaurus* and the raptors scavenged off its kills?

Finding out exactly which was the answer is vague. And even if one did narrow it down to *Deinonychus* having been the cause of death, it can be hard to gauge if this was usual behavior for them. Wolves hunt in packs regularly and live in family units, crocodiles occasionally form organized coalitions to hunt prey together, and komodo dragons occasionally dogpile a target of opportunity in a disorganized mob that later separates. All of these however, could leave the same evidence of group hunting similar to what was seen in the dead *Tenontosaurus* surrounded by shed *Deinonychus* teeth, without it being clear which it was. We need to be careful about our assumptions before committing to one and the fossil record keeps many mysteries.

But we can still use the modern day as a lens to understand the bygone times.

While it is possible larger types of dromaeosaurids did hunt in packs, when we look at the biology of smaller dromaeosaurids like *Adasaurus* and *Velociraptor*, we see traits consistent with a mesopredator more than we do an apex predator.

Mesopredators are the medium sized carnivores like bobcats, jackals, most monitor lizards, and many varieties of birds of prey. Some of these animals can be quite social, but almost all of them chiefly hunt alone or only with a mate. They have adaptations to puncture the organs and restrain prey typically their own size or smaller, and are proficient at being generalists which only rarely hunt things much larger than themselves but also might frequently partake in scavenging off the kills of larger carnivores.

A bobcat might eat mice and birds six days a week, then tackle a target of opportunity in the form of a deer on the seventh; then spend the rest of the month scavenging off a wolf pack or mountain lion's kills before making life more nerve wracking for rabbits it hunts. Mesopredators are adaptable and more often than not are not specialized enough to be effective pack hunters of large game.

*Adasaurus* and many raptors have binocular vision and large eyes for good visual acuity, a well developed inner-ear to help it balance when changing direction suddenly, and an agile frame would serve well in hunting agile prey in ambushes rather than chasing down large game in the open. Wings across its arms would aid both in helping it turn around quicker, as well as balance in the same way an eagle would after seizing prey and stabbing those iconic claws into them.

The claws of raptors have been often dubbed "killing claws" and it's not hard to see why. The sickle shaped talon is mounted on the equivalent of the 2nd toe on our foot, with the 3rd and 4th toes being the load bearing toes the animal walked on and the 1st toe (or "big toe" on us) being a mostly vestigial dewclaw. It's a distinct trait only they and a few other types of animals have.

Fictional and old non-fictional portrayals of raptors alike have long shown this talon like a recurved blade for carving and slashing foes. When *Deinonychus*, again, the very first raptor to garner widespread notice, was described by its discoverer in the 1960s, Dr. John Ostrom

speculated the animal's enlarged talon was a slashing tool to disembowel or slash open the throats of larger prey. In this respect, the claw was thought to serve a function not all that much different than the huge teeth of sabre-toothed cats or massive jaws of larger predatory dinosaurs

John Brosnan's 1983 novel, *Carnosaur*, had its antagonist *Deinonychus* character carving up human victims left and right with the description of being like Bruce Lee kicking with a scythe strapped to their foot. In the scientific realm at roughly the same time in 1987, Dawn Adams continued the speculation that the talons on even just man-sized raptors could potentially be used to gut, slash, and disembowel large herbivorous dinosaurs many dozens of times larger than the raptors and this might have allowed raptors to compete with much larger predatory dinosaurs as the apex of the ecosystem's carnivore biota.

And this idea of raptors using these big, lethal and yet elegant talons played into the tropes ascribed to them of high intelligence and cunning. Add in the assumption of them all using numbers to overcome the brutish, larger bodied dinosaurs and you got an appealing idea. It spawned many images of a titanic herbivore or even a seeming juggernaut of a giant predator getting overwhelmed by the smart, swift, skilled raptors. As typified by a speech by Sam Neil's character of Dr. Grant in the third *Jurassic Park* film, it lent to the idea that raptors were fast tracking their way to becoming the dominant species on the planet like we had managed to by brains and cunning instead of brawn, had a chance of fate not wiped out most of the dinosaurs when the asteroid struck.

The image of a pack of raptors squaring off with a monstrous *Tyrannosaurus* became burned into a whole generation's mind as the epitome of contrast in the dinosaur era. Numbers vs size, claw vs tooth, brains vs brawn, the old order of the brutish *Tyrannosaurus* given serious competition or to be surpassed by the new order of raptors. A mythic image to be sure.

But, as outlined earlier, raptors weren't necessarily all pack hunters nor apex predators. Some comparatively giant outliers like *Utahraptor* possibly were, but what about the others? The evidence currently is very lacking and we should be careful in interpretation.

Part of why we find the pack-hunting, gut-slashing raptor imagery so appealing might be related to our own history. We humans are apex predators despite not being remotely the most physically powerful or well armed predators in nature, because we used our intelligence to craft tools and become proficient big game hunters. So we naturally tend to see nature as “brains vs. brawn” and always root for the former.

A key thing to remember is that paleontologists in the 1960s-90s and prior did not have the tools or large quantities of fossil finds for reference they do today to understand prehistoric life. Behavior and function was and still is often a matter of speculation where complex models and modern animals are the best point of comparison. Studies on modern animal analogues were lacking in decades prior, and the software to reliably simulate things like how bone, tissue, or other body parts react to movements or stresses either didn't exist or were in their infancy.

You couldn't do what you can now, 3D scanning a fossil and then making a good approximate of the skeleton in a modeling program; and then give it the muscle force and movement of a comparable sized bird to see if your kicking, slashing raptor trying to gut a *Triceratops* with its claws would break the trike's belly or break it's own toe in the attempt.

More recent studies on the function of those iconic claws have shed light as to what they were being used for, and they don't support the idea these were butcher blades used against big animals.

Dr. Philip Manning and his colleague in their 2005 study on the shape of raptor claws found that they completely lacked a cutting edge on the inner curve. Rather than slash, the shape of the claws were much closer to those used by large felines to hook and hang onto prey or those employed by birds to grip both prey or trees. A follow-up study in 2009 found that while the claw was not at all good at slashing, it *was* quite well suited as both a climbing spike and puncturing weapon. This along with the discovery of arboreal species like *Microraptor*, helped support the notion that raptors as a whole were proficient climbers and the claw served to assist them in scaling trees and going after prey comparable in size to themselves.

That the gliding, potentially even flight capable *Microraptor* has also been found to have a body type very similar to what the earliest raptors

likely had is also a big clue as to what the claws were for. The earliest birds, like *Archaeopteryx*, skeletally are extremely similar to *Microraptor*, and also have the same sort of enlarged claw on the second toe. Even today if one looks at the feet of many perching birds, one can see it's quite common for the claw on the second toe to be somewhat larger and more recurved than the others. It can help out a lot in both climbing, gripping tree bark, as well as restraining prey both for the actual killing and then processing of the carcass.

That early raptors, like the hawk sized *Microraptor*, likely spent a lot of time both on the forest floor and in trees supports the idea the big claws were initially a multi-purpose tool that helped in climbing, before raptors grew in size and started living more and more on the ground. But, even with the group generally growing in size with later species, more research has supported the idea that even the larger dromaeosaurs were still proficient climbers with their claws.

In 2019, these notions were further vindicated when an effort by Dr. Peter Bishop and his research colleagues studied the raptor that started this whole notion with *Deinonychus*. The very animal typified as using its talon to disembowel larger prey from the 1960s to the 2000s, the new modeling and simulations working with both the claw and leg musculature supported the implication that *Deinonychus* and its cousins' talons could do almost anything *but* slash. Instead, it was most likely employing them as a restraining tool and stabbing weapon against prey it was grappling with and pinning to the ground.

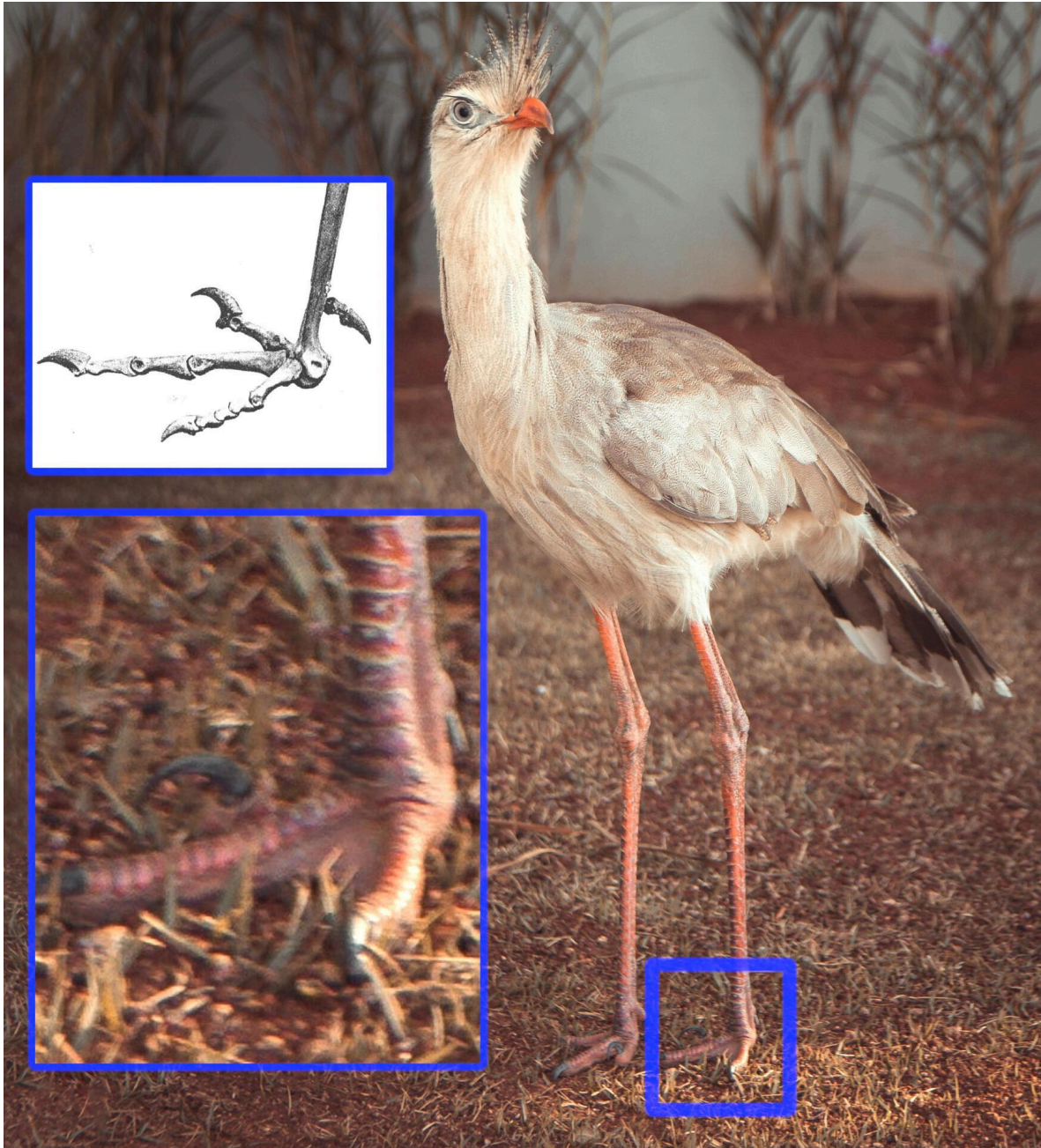
The claw it seems was used in hunting prey, among other purposes like climbing; but as a stabbing tool chiefly only useful against animals roughly up to the same size as the raptor itself. It could certainly use them on larger animals in emergencies for defense, but this was not the lethal weapons to fell multi-tonne animals they were once envisioned as. Even the biggest raptor in history wouldn't have had a claw long enough to pierce the vital organs of a *Tyrannosaurus* for instance, not with over a foot of muscle, hide, and bone to get through.

One infamous dromaeosaurid fossil supported these findings. The "Fighting Dinosaurs" showed a coyote-sized *Velociraptor* who died locked in combat with a sheep-sized dinosaur called *Protoceratops*. In their final acts, the *Velociraptor* tried to kill its opponent by gouging its

foot-borne talon into the *Protoceratops*' neck and collar; rather than slashing at it.

The fact *Adasaurus* has somewhat reduced sickle claws compared to some of its relatives further supports that the infamous talons were less for stabbing large animals, and more for puncturing and pinning prey while doing double duty as climbing spikes. If they were truly instruments of destruction against large game, they'd be much larger and be shaped differently. The fact birds, the closest living relatives to Dromaeosaurids, often have enlarged inner claws for the exact same reasons in predatory species supports this multi-used tool idea for the claws as stabbing and pinning tools against small prey. Coincidentally, or perhaps not, it was their claws resembling those of eagles and hawks is the entire reason Dromaeosaurids were nicknamed and many bore the name "Raptor" to begin with.

One distant cousin of the falcon family, the South American seriema, primarily hunts prey on the ground and does so using sickle-shaped claws uncannily similar to those of Dromaeosaurids. And seriema almost exclusively use their claws to pin down and impale small game before dismembering it with their jaws. And while seriema's are capable of flight, they almost never do and hunt mostly on the ground like predatory dinosaurs. This is similar to a degree to the most primitive dromaeosaurs like *Microraptor*, which were also capable of some limited amount of flight whilst chiefly hunting on foot. This is one modern point of comparison to dromaeosaurids as a whole, so it would be unlikely a similar tool on *Adasaurus* or any raptor was employed with no similarities in purpose.



A Red-Legged Seriema, a South American predatory bird distantly related to falcons but chiefly hunts on the ground. Dromaeosaurid-like claw highlighted. Photo by Rodrigo Pereira, Public Domain)

So while the modern world is not the same as the world before, looking at modern nature can still give context and support probabilities of what happened in earth's past.

The body of a dromaeosaurid as a basis is already poorly suited to be an apex predator of large game, even in a pack. The largest raptor known, *Utahraptor*, has some of the best evidence for pack hunting and outsizes its next largest relative by a considerable margin. But even then, it was

potentially one of the most ‘un-raptor’ raptors to ever exist. Sporting a very bulky frame, abnormally robust jaws for its family, and with both the arms and iconic ‘Killing Claw’ on the toe somewhat reduced in size to what one would expect. In general build, it more closely resembles a smaller version of different predatory dinosaur families like a tyrannosaur than a scaled up version of something like *Velociraptor*.

It’s clearly still a raptor, but *Utahraptor* is a genus that had adapted to be a large carnivore and had to change accordingly. It is also one of the very few times a raptor was the biggest predator in its ecosystem. This is contrary to the observation that a vast majority of other raptor species are far outsized by contemporaneous meat eating dinosaurs of other groups like tyrannosaurs, indicating that they and not the raptors, were the apex predators of their times and regions.

And remember what was said earlier about apex predators often hunting socially more often than smaller carnivores? This lines up here as well, as many of these predators like tyrannosaurs also show just as much, if not more signs of pack hunting than raptors ever have. This furthers the implication that raptors were not typically hunting big game and competing with the local tyrannosaur pack. Not in general as apex predators nor in a group as pack hunters. The few times they have, like in the case of *Utahraptor*, they had to abandon many of the adaptations that they are known for in favor of others. That *Utahraptor* also predates the major rise of potentially pack hunting tyrannosaurs at being over 130 million years old might not be entirely coincidental, as its niche might have been filled by the later tyrant reptiles instead of future raptors.

In this light *Utahraptor* can be seen as an experiment of sorts. An early venture at being apex predators shortly after some raptors grew in size from arboreal ancestors in the trees. It was a successful run, the mightiest of all dromaeosaurids existing for several millions of years, but not one that most raptors afterwards would try again. Instead it was the smaller, more flexible and adaptable dromaeosaurids that took up every carnivore niche *but* apex predators which became more common. Large forms would exist after *Utahraptor* too, but none were as robust and these

forms were quite rare. As a whole, raptors just seemed to have more success being mesopredators and this role served the majority of them well for tens of millions of years.

If one needs more proof of this, in the 2010s and as recently as 2022, an entire new branch of the raptor family tree was discovered and documented. The Halszkaraptors sported adaptations similar to diving and fishing birds like cormorants and loons. A testament to the diversity of raptors, for dozens of millions of years, fishing raptors thrived alongside a variety of other forms.

So the big, sickle shaped talons so often admired and feared on-screen were most likely not for gutting large prey. Nor would a majority of raptors have any concept of social living or leadership. Carving through solid muscle, hide, and potential bone with a claw that lacks a cutting edge is near impossible; and a single bash by a multi-tonne herbivore would shatter every bone in most raptors' bodies regardless of if they had a pack to support them.



*Natovenator polydontus*, a diving, fish eating raptor from the Halszkaraptor group. Scientifically described in 2022 and living roughly 71 million years ago, a raptor like this was possibly contemporary to *Adasaurus* and *Velociraptor*.  
(taken from Lee et al. 2022, Artwork by Yusik Choi)

Instead their big claws, alongside their winged arms (which scientists in the 1980s couldn't have known about), decent intelligence, and high maneuverability were better suited at serving as mesopredators more often than not. Keen eyes to judge distances as they jumped between

foliage and possibly trees, with wings helping to steady their jumps or pounces with parachutes or glides. Once the prey was struck, they'd be pinned down before they'd have much chance to react, and those that did would have a hard time throwing the raptor off thanks to the predator's wings and tail helping balance it. A claw stabbed through the chest would make the quarry quickly go into shock by the time the jaws got to work fully dispatching them.

So while we can't hop into a time portal and watch the *Adasaurus* or *Velociraptor* special on Animal Planet, we can make a good hypothesis about what it was doing based on their anatomy, the ecosystem it lived in, and the types of animal that occupy a similar role today like bobcats. The raptor's compatriots would have included a huge spectrum of carnivores, some smaller and many much larger. With tyrannosaurs like *Tarbosaurus* and *Alioramus* clearly holding the top and second spot amongst the larger carnivores, *Adasaurus* comfortably fits between them and a myriad of smaller predators. If *Tarbosaurus* was the tiger of Late Cretaceous east Asia, *Adasaurus* was the jackal or fox.

So by observing mesopredators like jackals and bobcats for animals that would have behavior the most like *Adasaurus*, and observing the function of body parts in animals that anatomically resemble *Adasaurus* the most, birds of prey with similar talons and wings; we can make a reasonably accurate approximation of what this long extinct animal was doing for at least some of its behaviors. In the niche of a jackal where it has to be quite resourceful and clever about avoiding dangers, with the tools of a hawk, and the senses of a bobcat; an *Adasaurus* like Ruby was almost certainly a clever girl indeed even if she wasn't quite doing what the stars of Michael Crichton's novel or its aftermath were doing.

# MEET THE SPECIES



*Adasaurus mongoliensis* by Cheyenne Grier

**Name:** *Adasaurus mongoliensis* (Add-a-saur-us mon-goal-li-en-sis)

**Name Meaning:** Demon reptile from Mongolia

**Family:** Dromaeosauridae (“Raptor Dinosaurs”)

**Height:** 1 meter

**Length:** 3.5 meters

**Mass:** 50 kilograms

Discovered in the late 1970s and named in the 1980s, *Adasaurus mongoliensis* is a member of the famous velociraptorinae subfamily; meaning it’s from the same branch of the family tree the group’s namesake, *Velociraptor*, is from. Closely resembling its cousin,

*Adasaurus* was roughly twice the mass and existed a little bit later in time at about 70-68 million years ago to *Velociraptor*'s 75-71 million years back. It is possible *Adasaurus* was a descendant species from a close relative, or possibly *Velociraptor* itself. This raptor had the classic look of its group, a skinny snout, long tail, and a very avian appearance.

While the exact color of the feathers on *Adasaurus* is unknown, multiple skin fossils of other raptors show enough consistency to gauge where the feathers were and a sense of what possibilities existed. Chances are the only unfeathered portions on a raptor were largely the only places you find bare skin or feathers on a predator bird like a hawk; being mostly the feet and latter half of the snout. Many birds that spend a lot of time on the ground or perched to look out for prey sport colors ranging from rusty reds, to browns, to blacks and whites; so in all likelihood it would be that most raptors were similar. Red being a distinctive and possible color is what inspired the coloration and name of the protagonist of this story, "Ruby".

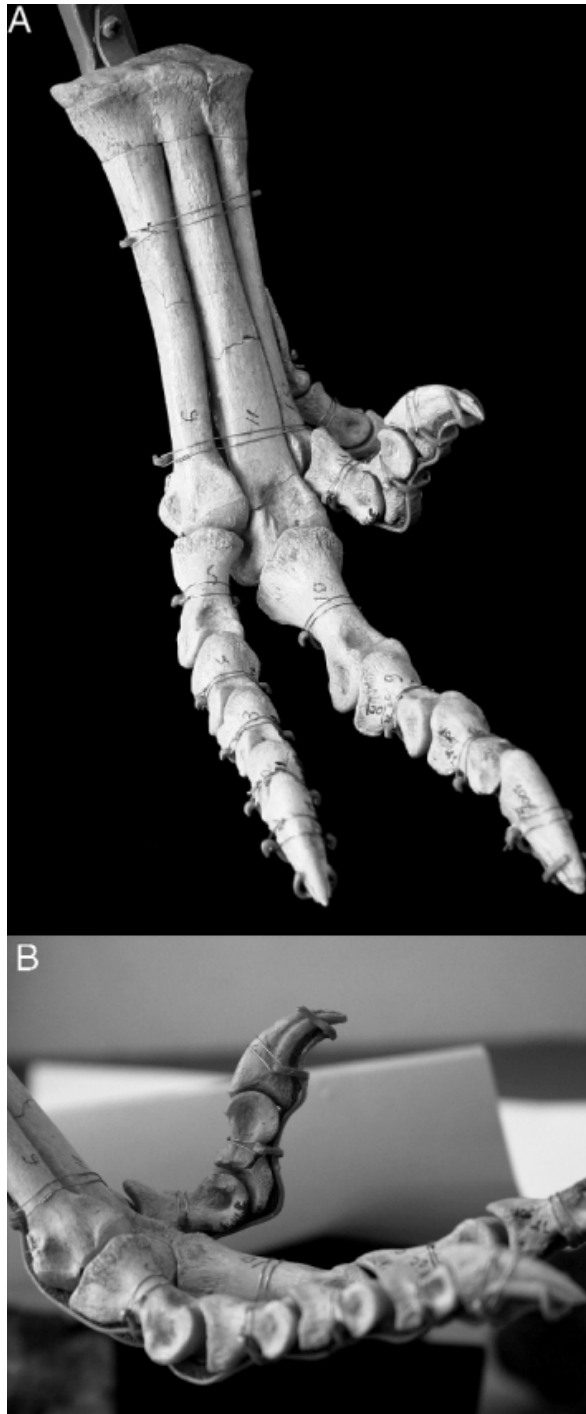
*Adasaurus* did have some interesting unique qualities to its known specimens that were rare in its family. While the skull was skinny and lean as a whole like most of its particular branch of the velociraptor family tree, it was a bit more robust than most of its closer relatives. It also was one of, if not the largest of the velociraptorinae group; with a majority of its closest relatives being about half the size. Comparing *Adasaurus* to *Velociraptor* itself is like contrasting a lynx with a house cat. Despite its size however, *Adasaurus* had proportionally smaller versions of the raptor family's iconic claws than most of its kin. The claw mounted on the second toe was still larger and more hooked than the rest of the foot claws, so it was still fully functional; but this indicates *Adasaurus* was using this talon less than its smaller cousins were and living differently.

A raptor's infamous claw served a variety of functions, as discussed earlier. Most of such claws were likely used for everything from a climbing spike to grip tree bark and branches. Or a puncturing weapon to stab into a prey's vitals in the case of hawks, owls, and eagles. Some of the earliest raptors like the raven-sized *Microraptor* were adept arborealists and early birds have a similar recurved claw. That the claw likely started out as a climbing spike to grip branches is well supported. In fact it's likely that, outside of a few giant forms like *Utahraptor*, most

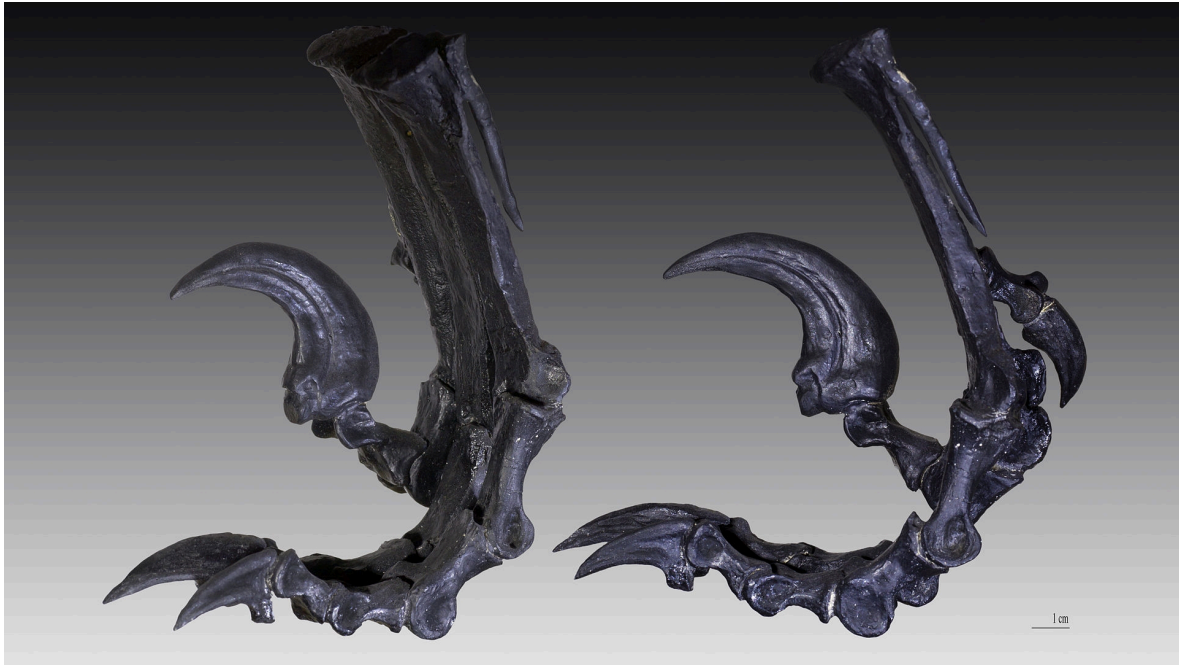
later forms were capable of getting up into a tree even after they started to evolve larger size and ground habits.

That *Adasaurus* has a reduced claw compared to other raptors implies it was chiefly living a bit differently than its relatives. The exact reasoning is still unknown, some possibilities exist-

- Maybe larger size overall whilst still preying on chiefly small game meant a big claw was overkill and the jaws were more than enough?
- Or inversely, did larger size helped it hunt somewhat larger prey where the claw was less efficient as a killing or restraining tool?
- Or perhaps *Adasaurus* was getting most of its calories doing something else for its food than most raptors were, such as exploiting carrion more often?



A front (A) and side (B) view of *Adasaurus*' right foot, showing a 2nd digit claw smaller than what is expected for a dromaeosaurid and is unique to *Adasaurus* (taken from Turner et al. 2012)



Two views of the left foot of *Deinonychus* (cast from holotype specimen YPM 5205) showing the more typical dromaeosaurid foot with large 2nd digit claws,  
Taken at Peabody Museum of Natural History,  
(photographed and edited by Didier Descouens for Wikipedia, used with Creative Commons License (<https://creativecommons.org/licenses/by-sa/4.0/legalcode>))

More finds will need to be uncovered and studied to know more about *Adasaurus*' particular reasoning for their unique build, and I eagerly await such discoveries! For the sake of the story, I leaned into multiple possibilities. Most of the prey the *Adasaurus* targets in the story are smaller than itself with additional dining on already opened carcasses that a larger predator like a *Tarbosaurus* had hunted down, while still being capable of climbing and using those claws as defensive stabbing weapons if the need arose.

Another rare feature of the known *Adasaurus* material is the holotype (the specimen used to classify the animal as something distinct from what was known prior) had many bone fusions and warping of the bones. It was initially hypothesized to be from healed injuries or illness, and some of the distortions to the bone very well could still be from old wounds. However, later reassessment supported that these were instead chiefly caused by the individual reaching a very *advanced age*. By luck, happenstance, or lifestyle, this individual *Adasaurus* had likely lived to be quite elderly and this is very very rare in wild animals. Especially rare in predators, who lead a high stress lifestyle that can increase chance of injury and starvation.

In birds of prey, one of the closest points of comparison amongst modern animals to look at dromaeosaurs through, the longest lived members are typically from the vulture families. While not an ironclad rule, typically vultures which dine on carrion and comparatively small animals live longer than comparably sized eagles and hawks that go after bigger and faster prey; sometimes with the former living decades more. Virtually all birds of prey which can live over half a century are vultures.

While scavenging and preying on smaller prey isn't a stress-free life, it might have a lot of perks to it. Vultures of both the Old and New World varieties also have reduced claws. While they do scavenge often, they do hunt by chiefly using their sharp beaks and jaws to dispatch small animals. *Adasaurus* has a somewhat more robust skull than other velociraptor-branch members and reduced claws as well. It is possible there are some lines of similarity between these two carnivorous dinosaur families, even if *Adasaurus* couldn't be a dedicated scavenger as it lacked the ability to fly and cover larger distances to search for carcasses.

The symbiotic bond between the *Adasaurus* and *Tarbosaurus* might seem anthropomorphic or extreme, but it is very much based on a set of behaviors that exists in nature. It just does bear noting that it would be all but impossible to prove from the fossil record and is only an invention of the tale to entertain and explore a possibility. While it might seem odd for predators to form partnerships between one another, nature is nothing but an infinite field of circumstances to test an infinite variety of diversity in behaviors as much as it is physical forms. Given enough time and circumstances, almost any interaction seen in the modern world certainly existed in the past.

Predator cooperation has been seen in a great many species, large and small, and in almost every biome imaginable. Some prominent examples include coyotes and badgers, wolves and ravens, as well as dikkop birds and crocodiles. It was these I used as a reference point to write the story you have read, whilst working within the margins of possibility. Some bonds are less extreme and are more on the level of acquaintanceships if one wanted to use such a term, but others can test the term of companionship or friendship past human usage.

Coyotes and American Badgers are an example of two predators who share a food source finding a way to team-up instead of competing. Both

are fond of hunting large rodents like marmots, which frequently live in burrows. Marmots can out-run badgers due to the badger's short and stocky build being poor at sprinting, and can out-dig coyotes due to the coyote's tall and lanky build being poor at excavating. But a badger can out-dig a marmot and a coyote can out-run them.

So the two wily predators' solution is to coordinate and go at the rodents at the same time. If the marmot tries to flee from the underground to get away from the badger, the coyote runs it down. If the prey tries to duck into a burrow to escape the coyote, the badger can dig it out. Working together, the two catch more prey and have less of a chance to waste energy on a failed hunt.

And this isn't just lucky a happenstance of them both just coincidentally going for the marmots at the same time or one exploiting the other. Coyotes and badgers have been photographed and videotaped together before the hunt started with full awareness of each other and no signs of conflict. Coyotes and badgers familiar with one another will even spend time together outside of hunts, traveling and socializing together to the point of play behaviors. So in the right circumstances, two predators can change their means of acquiring food to a mutual benefit.



A coyote and american badger socializing, photographed by US Fish & Wildlife Service (Public Domain)

There are also examples of small carnivores forming a partnership with an apex predator. While apex predators do hunt medium size predators, comparatively small carnivores are typically ignored. There might even be a mutual benefit despite different food preferences. Wolves and ravens are one such example. Both are highly intelligent and can benefit each other with behaviors outside of hunting. Ravens have been documented calling out to, responding to, and even playing with young wolves in the

pack. The wolf packs meanwhile learn to follow and pay attention to what ravens are doing, as the birds might both warn of danger and help signal the pack members when food or a rival is nearby from an aerial view. The bonding typically starts at an early age with the birds at times even seemingly acting like babysitters for the pack.

And just when one would think such relations wouldn't be chanced when the most vulnerable of a species, the eggs and infants, are exposed to the mercy of an outsider; nature again can reveal a surprise. A Nile crocodile is a formidable predator in the water, but while still threatening on land it can suffer from low mobility and stamina due to its short legs and ectothermic ("cold-blooded") metabolism making it tire out quickly on land. And when defending its nest, a mother crocodile might need to occasionally have to retreat back to the water to both find food, drink, and cool herself off if a hot day brings the risk of overheating. In most situations, this leaves the nest unguarded and at risk of poaching by many predators, like monitor lizards, both looking to remove crocodiles before they grow large and make an easy meal in the eggs.

But should one try to raid the nest, they might find themselves getting rushed at, pecked, and kicked by a small, but very scrappy bird called a Water Dikkop. The Dikkop will frequently lay their own eggs either adjacent to a crocodile nest, and then furiously defend both their own and the mother crocodile's eggs. And contrary to their unassuming size and lack of talons, these little birds can be courageous during nest defense, spreading their wings in threat displays whilst furiously pecking, biting, kicking, and mobbing even intruders to the nest site many times their size. And should the scrappy birds need back up, they can effectively call in multiple hundred kilograms worth of it because Nile crocodiles will respond to Dikkop alarm calls.

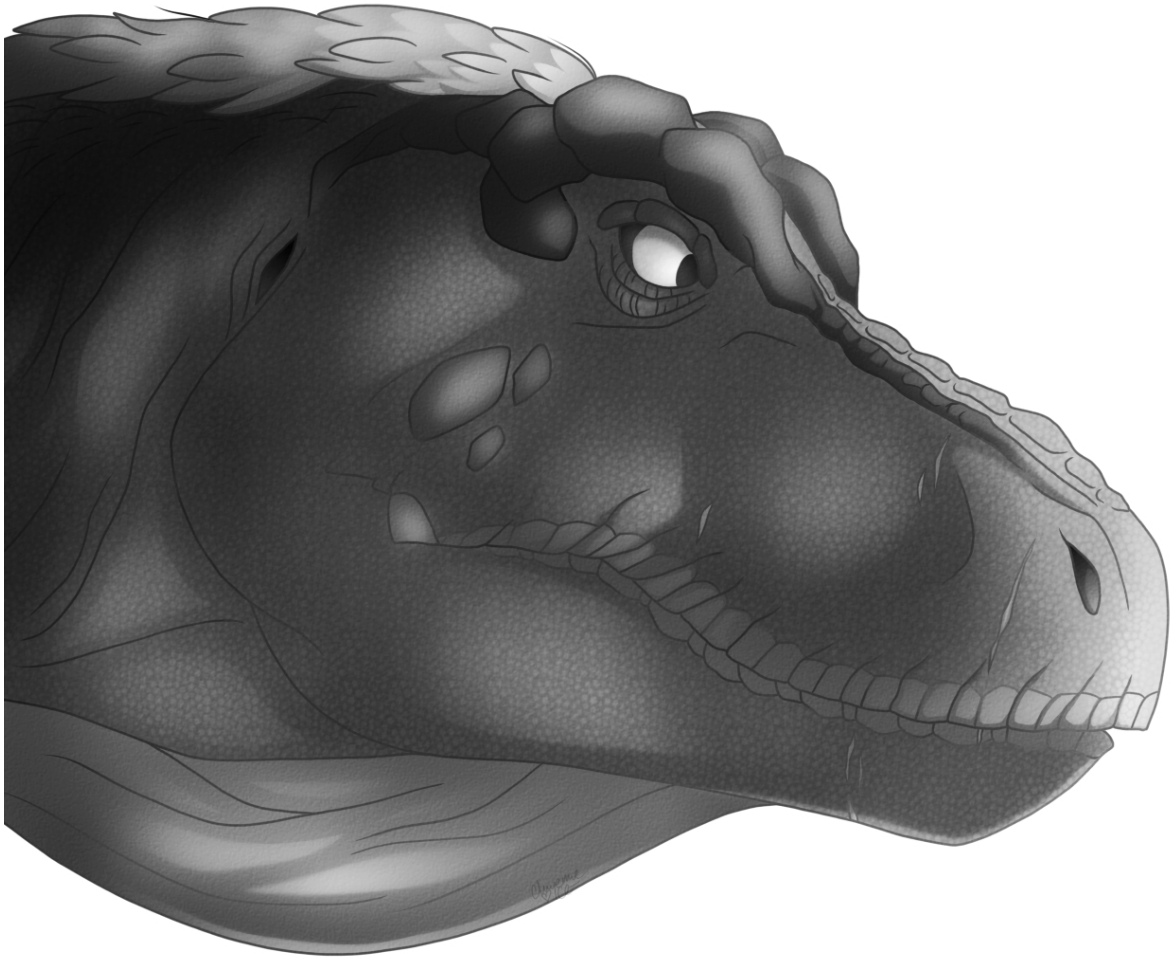
The benefits of this partnership extend both ways. The crocodile, while much larger and more powerful, is slower on land and can only act in short bursts. The Dikkop is lively and swift, but lacks in power. By partnering, the crocodile is able to conserve its strength for when it's needed and the Dikkop gets a trump card to play should their own defense not be enough. In the end, both of their next generation have a better chance of surviving.

This unexpected partnership between crocodile and bird was the basis for the fictional symbiosis between *Adasaurus* and *Tarbosaurus*, coupled with traits of the joint predator unions between coyotes and badgers, ravens and wolves, and tigers and jackals (see further on). *Adasaurus*' reduced claws, larger size, and potential for advanced age were the established evidence and these behaviors were configured to offer up a potential explanation for why these facets were the way they were.

Larger size compared to the likes of *Velociraptor* would help the *Adasaurus* function better as a nest guardian for better threat displays, emulation of *Tarbosaurus* calls; and incubating eggs. The claws were reduced despite the higher calorie needs of this larger size by partnering with a *Tarbosaurus* and scavenging off the apex predator's ample leftovers. And this safety net of a lifestyle meant a higher chance of seeing an elderly age.

This even influenced the coloration of the two characters. Pigments like red can be very dependent on diet. Both the *Tarbosaurus* and *Adasaurus* in the story are colored dark red, and this similarity due can be explained by the *Adasaurus* often supplementing their diet with what the *Tarbosaurus* brought down. Understanding of dinosaur coloration is still a growing field, as chances are they were both not quite as colorful as some depictions make them out to be but more vibrant than modern large mammals. The current colors for *Adasaurus* and *Tarbosaurus* are unknown, but there was a logic behind the choice to make them both a rusty color here.

Was this how it happened in the past? Who can say. Behavior is one of those things about prehistoric animals that rarely fossilize in ways that leave only one possible answer. My point here was to tell an entertaining story while working within the margins of what is known by filling in the blanks with what is possible. Given both dromaeosaurs and tyrannosaurs coexisted together for almost 100 million years, chances are a lot of the behaviors we see between different species of carnivores today cropped up somewhere in that span of time.



*Tarbosaurus bataar* by Cheyenne Grier

**Name:** *Tarbosaurus bataar* (Tar-bo-saur-us b-ah-tar)

**Name Meaning:** Alarming Reptile Hero

**Family:** Tyrannosauridae (“Tyrant Reptiles”)

**Height:** 3.25 meters

**Length:** 11 meters

**Mass:** 5,000 kilograms

The apex predator of Mongolia’s Nemegt Formation that this story takes place in, *Tarbosaurus* was the largest of all known members of the Tyrannosauridae family after *Tyrannosaurus rex* itself. Approaching similar lengths and heights to its later relative, *Tarbosaurus* also had a quite powerful bite; though it had more emphasis on slicing than the

crushing potential of its North American kingly counterpart. After a minor extinction event caused by a climate shift roughly 68 million years ago in North America, an influx of animals from Asia helped replace what had been lost. One of these animal species went on to become *Tyrannosaurus rex*, replacing the extinct North American tyrannosaurids like *Albertosaurus*. This animal was likely either a very close relative to, or was *Tarbosaurus* itself.

Either way, this Mongolian giant carnivore is a window into the history of the Tyrant Reptiles prior to their famous namesake. Discovered in the 1940s and named in the 1950s, *Tarbosaurus bataar* was initially taken to be an Asiatic species related to *Tyrannosaurus rex*, as *Tyrannosaurus bataar*. Every now and then some experts still lump the two animals into the same genus name, but a majority noted the distinct morphological, geographical, and temporal distance between the two and put them instead as close relatives, but still distinct enough to warrant a different genus name.

Like many of its kin, *Tarbosaurus* had long legs, a thick and powerful tail, robust torso, small arms, and a large head. Its body was extremely powerful, but also deceptively agile. Tyrannosaurs as a whole were very nimble animals, able to pivot and rapidly change direction or rotate about on even just one foot more so than other large dinosaurs. While big at upwards of 5 metric tonnes, *Tarbosaurus* was still light enough to be quite fast on its feet and more than capable of keeping up with smaller predators in the agility department, as well as dodging retaliation blows from potentially dangerous prey. Even a fully grown individual would be easily capable of turning about and making a full rotation if they found themselves getting flanked. All the better to keep their reinforced and tooth bearing skull pointed at their opposition.

And considering said jaw had a meter long row of sixty teeth, each upwards of 9 centimeters long, the best place to be around a mad *Tarbosaurus* would be someplace other than where it is facing. Keen eyesight and a good sense of smell would help it survey near and far distances, letting it know who or what lay around it for potentially kilometers in a span. And with powerful legs to help propel it for either long distances or a quick sprint, the Alarming Reptile was well equipped to survey those large stretches of territory.

When incorporating *Tarbosaurus* into the story, I used the known fossils as the basis and extrapolated using known animals from there to fit within the margins. For size and general appearance, the character of “Khan” was based on the holotype specimen for the genus, labeled PIN 551–1. To this day, it remains one of, if not the largest known of its species.

*Tarbosaurus* was the largest predator in its range by a wide margin, and several fossil sites have indicated multiple individuals of different age groups being found at the same place and time. Coupled with additional studies on brain anatomy showing that archosaurs (the group dinosaurs, pterosaurs, crocodylians, and relation belong to) can have very high problem solving intelligence and memory despite a small brain size compared to body size, and it is quite likely *Tarbosaurus* was cognitively at least capable of complex social behavior. After all, in modern nature today, sometimes the most intelligent animals in an ecosystem are apex predators who have to chase down prey over large ranges of territory like hyenas, big cats, orca, and wolves. It makes sense the past was probably not too different in some regards.

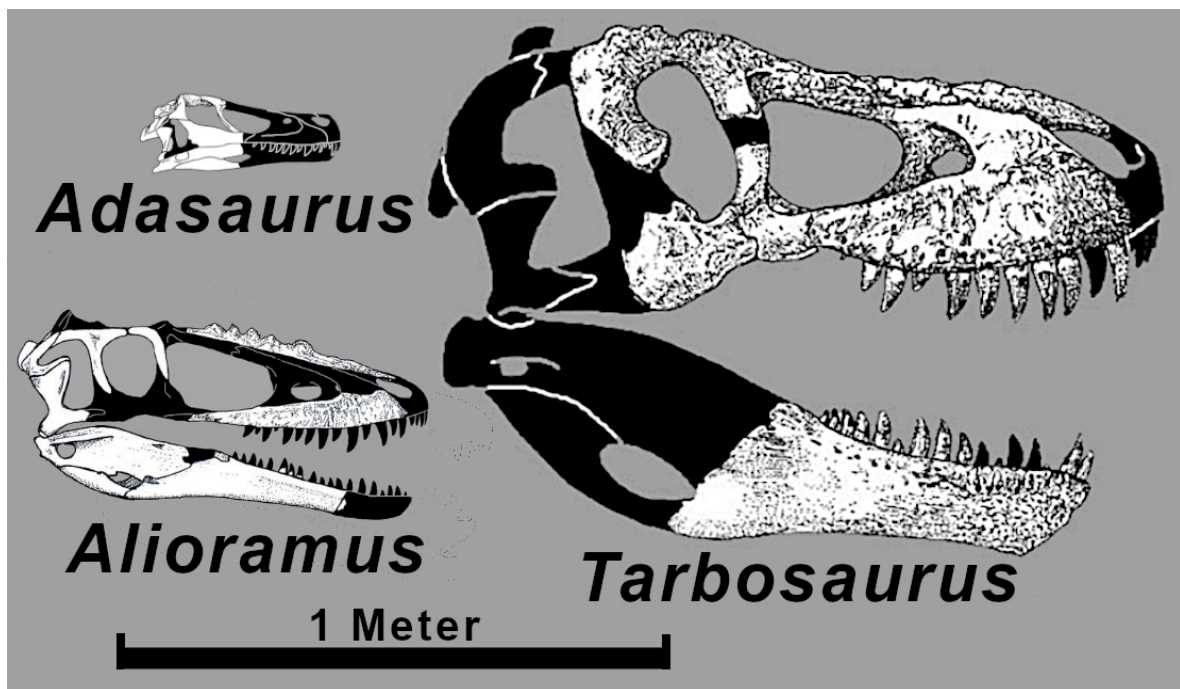
The modern animal behavioral influences for the story’s take on *Tarbosaurus*’ character were chiefly from large crocodylians, eagles, with large ground birds like cassowaries and a modern Asiatic apex predator in the tiger rounding out the base. While this might seem like a recipe for a horror show, the intent was to also show off some more nuanced behaviors.

Tyrannosaurs in popular media are often typified as solitary, gigantic bruisers, be they protagonist or antagonist. And while they certainly go throw their weight around like modern apex predators, they often were not the largest animals in their ecosystems and likely had to live smarter instead of fighting harder.

Tigers prey on large herbivores and medium sized carnivores like dholes and wolves, but frequently ignore small predators such as foxes and jackals which often benefit by both feeding off tiger kills and from the apex’s hunts on other predators. Some of the medium sized carnivores that tigers make a point to hunt, like wolves and dholes, are predators themselves of smaller predators like jackals; but also will go out of their way to target the young of apex predators to remove a threat before it grows larger. This tiering of predators with large, medium, and small

paying more attention to their adjacent size tiers than either does at the opposite end is true in many ecosystems. While it isn't always the case that big predators ignore their tiny neighbors, it's common enough to be a general rule and predatory antagonism is most often directed at those in the next adjacent size tier.

In this case, replacing the modern Indian predators of tigers, wolves, and jackals; with their ancient counterparts from Mongolia's Nemegt Formation in *Tarbosaurus*, *Alioramus*, and *Adasaurus*. Tigers target wolves but largely ignore jackals, wolves sometimes hunt jackals and young tigers, and jackals try to avoid wolves but aren't as fearful of tigers. Exceptions always exist, so we should use caution fitting modern paradigms into the past as no rule is ironclad. But repeated trends can lead to reasonable assumptions.



Three of the predator niche tiers from the Nemegt Formation, each represented by their holotype specimens. Black represents portions missing from the original specimens, filled in by subsequent finds or close relatives.

(Adapted from Paleofile.com by Ford 2022)

Eagles as well as the cassowary again were used as reference points to show the nurturing and parental behavior in this particular tyrannosaur. In most birds of prey, both parents play a role in raising their offspring. In most ratite birds like cassowaries, this job is typically exclusive to the

fathers. Because I wanted to break the persistent mold of tyrannosaurs as brutish, solitary, and antagonist killing machines and the default assumption of caring parents being just the mother or a couple; I went with Khan being the sole biological parent seen. Perhaps he's just starting out with a new clutch after his older children have gone to start their own packs and that is why he is alone? Cassowaries also played a factor in both the calls the *Tarbosaurus* uses, which is why the calls are described as less a shrill roar common in films and more as a booming bellow.

Whether Khan being alone could be interpreted as both parents would care for their young and something happened to Khan's mate, or if Khan is shouldering parenting duties solo like a cassowary father; I leave up to the reader. Either scenario is just as likely as the mother being the protector of their young which is most commonly shown in media, and more likely than abandoning the offspring early.

For the sake of the story, I opted to refer to the male *Tarbosaurus* as a "drake". This is both a homage to several Asiatic tyrannosaurs having the Mandarin Chinese word for "dragon" in their name, such as *Dilong* and *Guanlong*; as well as acknowledgement of tyrannosaurs being in the same clade of dinosaurs that birds arose from. After all, many male birds like waterfowl are called "drakes". This is however entirely a term I myself used and is not official, as no such official designation exists for what you'd call a male or female dinosaur of the non-bird varieties.

Lastly, as stated previously in the *Adasaurus* section, crocodilians were an inspiration to give the characters of Ruby and Khan a symbiotic relationship with Khan playing the role of a Nile crocodile to Ruby's dikkop bird. The partnership was just transferred from a mother crocodile to a father bird for the basis. This sort of team-up, from rigid and frequent cooperation to just mild affiliation, has appeared many times in nature between a large predator and a much smaller animal. More likely than not, this sort of partnership happened in some dinosaurs as well.

To give another pair of examples relevant to the speculation employed, certain small frogs form alliances with tarantulas in South America and central Asia. One would think the spider would easily consume the small amphibian, and they certainly could; but instead they strike an accord together as roommates. The tiny frog lives in the safety of the spider's

burrow and is protected from lizard and snake predators; whilst the tiny amphibian guards the spider's eggs from foraging ants.

And to a much looser degree, jackals and tigers in India at times strike up an acquaintanceship where some jackals will summon the tiger with a specific call if the wild dog finds prey too large for it to handle but the game is within the range for a tiger to dispatch. After the tiger makes the kill and has its fill, scavenging off the panther's leftovers provides ample food for jackals, especially those starting a family. The tiger's presence might also afford some protection to the jackals by proxy, whom the tiger mostly ignores outside of prey calls, because tigers will attack leopards, dhole, and wolf packs which might pose a threat to small jackals. In this case the tiger isn't actively protecting the jackals, but its presence does affect the smaller predator's behavior.

But again, symbiosis is functionally impossible to prove in the fossil record outside of very specific instances. Out of context if someone had no idea what a human or dog was, they might excavate a fossilized human ruin and come to the conclusion *Canis lupus familiaris* was an apex predator of a certain naked ape because they keep being found together and once in awhile a *Homo sapiens* fossil is found with tooth marks matching the canine. Context is king and sometimes lacking in the fossil record. We know dogs are mankind's best friend and not our apex predator, so it is possible two species found together in the same rock layers of the fossil record were also more friend than foe.

Did this type of symbiosis happen between *Tarbosaurus* and *Adasaurus*? There is no evidence to support it directly, and it very well might not have existed even if a *Tarbosaurus* would have little reason to hunt or harm an *Adasaurus* in most circumstances. However, because it is becoming increasingly common to notice such affinities in nature today; and given the sheer length of time the tyrannosaur and dromaeosaurid lineages coexisted, the possibility such behavior cropped up somewhere is there.

Again, for the sake of storytelling I just applied it to these two types of dinosaurs to show the margins nature is known to work within in a hopefully entertaining way. It was also done to show how the dynamics between a raptor and tyrannosaur, so frequently portrayed as adversaries and contrasts in fiction even with no fossil evidence to suggest any

rivalry, could have played out in some very unexpected and interesting ways.

The modern day is our lens to give context for what is possible in nature, and it can show us a huge variety of interactions and behaviors between both species to species and individual to individual. The ancient past was certainly no less diverse.



*Alioramus remotus* by Cheyenne Grier

**Name:** *Alioramus remotus* (Al-lio-ram-us re-mo-tus)

**Name Meaning:** The Other Branch who was Removed

**Family:** Tyrannosauridae (“Tyrant Reptiles”)

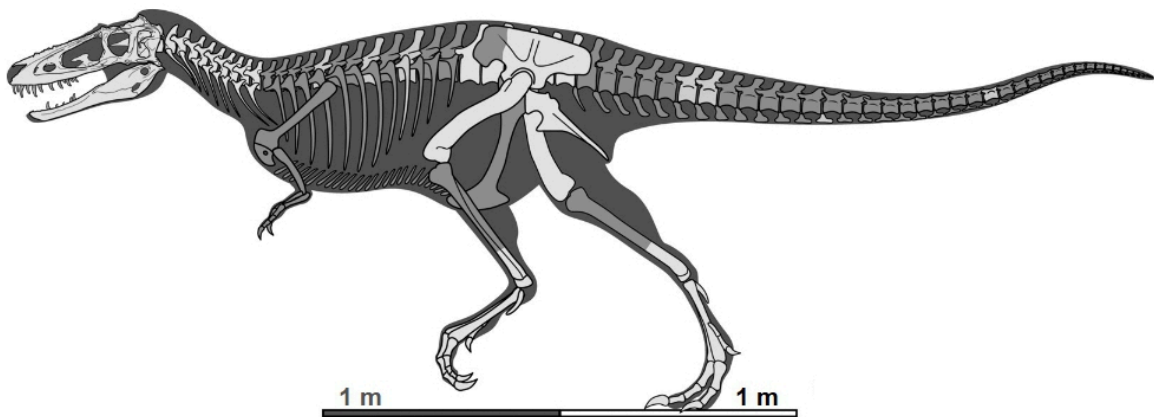
**Height:** 2 meters

**Length:** 6 meters

**Mass:** 1,200 kilograms

Across the tyrannosaur family tree there were once dozens of species. Some were as small as human sized, or even smaller, and others were multi-tonne giants which could rival the largest elephants in size.

*Alioramus* is something of a midliner of the group, being much larger than some of its more diminutive kin and outsizing a majority of the predators in its ecosystem; but still also being much smaller than the apex predator of its range. In terms of ecological niche, one might compare *Alioramus* as being the leopard to *Tarbosaurus*' tiger. The two had a similar general shape, but their builds and likely diets as well were quite different.



Skeletal reconstruction of the *Alioramus* holotype specimen (Brusatte et al. 2009)

The animal earned its name meaning “Other Branch” when it was discovered and named in the 1970s due to it being quite distinct from other tyrannosaurs known at the time. While the snout was elongated like its burlier cousins, it was very thin in terms of width and uniquely was decorated by a ridge of small horns going up the midline of the snout.

Horns as a whole are rare in carnivores, even small ones, so this was quite an eyebrow-raising trait. These were likely for display, be it to show maturity or health to others of its own kind. The thinner snout, loaded with sharp teeth more numerous than any other member of its family, coupled with a lean and very agile build, certainly imply *Alioramus* was hunting a different type of prey than the other tyrannosaur which shared its ecosystem, *Tarbosaurus*.

While it was not likely preying on large herbivores like its “Alarming” cousin was, *Alioramus* was still quite formidable to animals its own size or smaller. It can seem cowardly or less impressive to hunt smaller game than the awesome looking hunts involving multi-tonne herbivores, but we must remember that nature is not about things like honor or bravado. A predator which attacks without heed and seeks to down the mightiest prey it can find will likely wind up crippled or dead before they can contribute to the gene pool.

Large dinosaurs reproduced much faster and with more numerous offspring than mammals of comparable size. An elephant is pregnant for almost two years to produce, usually, a single baby. By comparison, a similarly sized dinosaur might produce half a dozen to a dozen or more eggs that’ll hatch in a quarter of the time. For every one adult, 6 tonne herbivorous dinosaur there could easily be multiple dozens of juvenile or subadults less than half that mass. Even if predators picked off a majority of the young before they reached adulthood, there was still more than enough to replace the parent generation.

Hunting juveniles or subadults might seem odd, but to a predator that’s still multiple thousands of pounds of meat to make a substantial meal that, while not effortlessly to dispatch, is much easier to find and kill than their adult forms. Even apex predators both modern and extinct chiefly hunt the less experienced and armed, so *Alioramus* could manage just fine with its leaner build going after smaller game than the adult forms of the massive herbivorous titans of its day. Even in a pack.

In the story I portrayed *Alioramus* as a social animal living in a small pack. Whether this group was a permanent organized family pack structure like wolves, a coalition of siblings like in male cheetahs, or a temporary grouping until the members seek individual territories and/or mates to start their families like young tigers; I’ll leave up to the reader.

Social habits in predators can be extremely diverse with no “one-style fits all” applying. Some predators also live socially, but still hunt alone for the most part. For example, both spotted and brown hyenas live in clans that offer their members protection and defense of the individuals and den sites. But, typically, brown hyenas hunt prey alone whereas their spotted cousins will go after prey as a group.

Social hunting to some extent or another has been observed in all major predatory vertebrate groups on land; mammals, crocodilians, and even some lizards. Some modern dinosaurs like Harris’s Hawks will even hunt with coordination and cooperation, so it’s not too shocking there are indications of non-avian dinosaur predators doing the same. And amongst the predatory dinosaurs, it’s actually not the dromaeosaurs but the often-portrayed-as-solitary tyrannosaurs that actually have some of the best evidence of hunting behaviors.

Multiple sites have been found suggesting plenty of tyrannosaurs were social to some degree or another. Some were kill sites where a prey animal shows signs of being fed upon by multiple tyrannosaurs of different ages at the same time, a key aspect of family and pack living. Others show multiple individuals of the same species, sometimes of the same age and sometimes with elderly, adults, and juveniles all together. Now combine this with studies on limb anatomy indicating the potential for tyrannosaurs being some of the best sprinters and runners amongst the predatory dinosaurs. These attributes are common to pack-hunting where coordination of flushing prey as a team in a chase is important.

All together, these facets of evidence combined with tyrannosaurs often making up the bulk of the large bodied carnivores in the ecosystems they live in, as remember pack hunting is more common in larger predators than small ones, makes it quite likely numerous species of the Tyrant Reptiles were social.

*Alioramus* is still a poorly understood dinosaur as its remains come from locations that aren’t the most extensively studied, and specimens have been very rare. Whether this means the animal itself was rare or just simply not living in locations that made it more likely to survive fossilizing can’t be said as of yet, and neither can its social habits. It might have been solitary, living in a mated pair, social and living in groups, or full on pack living and hunting. That evidence of pack hunting

has been found in tyrannosaurs both very distantly and very closely related to *Alioramus* however, means the possibility is always there unless direct evidence to the contrary is found. And while *Alioramus* is smaller than *Tarbosaurus*, it's by no means a tiny animal either.

*Alioramus* is a slender built predator who fits in-between the sizes of the giant *Tarbosaurus* and small raptors. Likely preying on swift moving prey does mean that pack behavior could be useful to drive quick game into the awaiting jaws of a packmate set in an ambush. Alternatively, living in a group might have helped afford them protection from the larger *Tarbosaurus*. While smaller, the size disparity between the two isn't so great that it would be borderline suicidal for a potential pack of *Alioramus* to try and hold their ground against a *Tarbosaurus* seeking to attack a nest site or claim a carcass the pack was enjoying.

Predators of the same size class rarely come into conflict in nature. Picking a fight with someone of equal size and armament comes with an extremely high risk of injury that offers no benefits if one triumphs. It is also very rare for two apex predators to dine exclusively on the same food, so removing a rival or competition usually wouldn't be a motive for such actions as one apex targeting another. So the movie trope that a death-match ensues the moment two apex predators stumble upon one another is more born out of the desire to see thrilling scenes of big monster fights than actual reality. Entertaining for sure and not impossible to happen, just are. Instead, conflicts between predators typically happen between those of different sizes and niches.

A tiger might kill or drive off wolves, who do likewise to jackals, who might do the same to foxes. The reasons why are two fold.

Big predators don't start life big. It's not at all uncommon for the juvenile and subadult stages of a large apex predator to hunt different prey than their fully grown parents. This means they'll be competing with at least some of the prey the adults of smaller predators will be hunting. Interactions like this can lead to mutual antagonism, and it's not uncommon for adults of large apex predators to dispatch medium sized predators both to remove a potential threat and ensure less competition to their offspring. Mutually, sizable but still smaller-than-apex predators might try to kill the young of apex predators to remove a potential threat before it gets too big and dangerous to dispatch.

Conversely, medium tiered predators might try to kill off even smaller predators if the chance arose to remove competition and potential assailants of their own young for the same reasons. Predators several tiers smaller than the apex however tend to be ignored by said apex.

This is what inspired the portrayal of the dynamics between the three tiers of predatory dinosaurs in this story. *Tarbosaurus* is the large apex predator, *Adasaurus* is the comparatively diminutive small predator; and *Alioramus* is directly in the middle. *Alioramus* in this scenario preys on *Adasaurus* for both food and to remove potential threats or competition for their young. The medium scale *Alioramus* would also seek to assassinate and cull the numbers of young *Tarbosaurus* to kill off what could be a huge threat to them before they grew in size. *Tarbosaurus* meanwhile doesn't see *Adasaurus* as a threat due to drastically different sizes, and a shared threat to their families helps unite them. In this way, I was able to portray *Alioramus* as a shared danger the two could oppose without anthropomorphizing natural behavior much.



*Therizinosaurus cheloniformis* by Cheyenne Grier

**Name:** *Therizinosaurus cheloniformis* (Ther-i-zino-saur-us chel-lon-i-form-is)

**Name Meaning:** Scythe Reptile who is like a Turtle

**Family:** Therizinosauridae (“Scythe Clawed Dinosaurs”)

**Height:** 5 meter

**Length:** 10 meters

**Mass:** 5,500 kilograms

First discovered in the 1940s and then named in the 1950s, *Therizinosaurus cheloniformis* was one of the “enigma dinosaurs” as some have dubbed them. Because the first fossils found were largely just material from the arms and there weren’t too many families of dinosaurs known in the 1950s, there weren’t any other body parts nor any close relatives to study that could give an idea of what the rest of the animal looked like. This contributed to its species name, “*cheloniformis*” meaning “turtle-like”, because the best guess at the time was that the claws resembled those of some river turtles which can have long claws and the discoverers weren’t even sure if they had a dinosaur’s hands on their hands or not.



The *Therizinosaurus* holotype specimen's initial remains at the Nagoya City Science Museum.  
Photographed by Yuya Tamai for Wikipedia, used with Creative Commons License  
(<https://creativecommons.org/licenses/by-sa/4.0/legalcode>)

Theropod dinosaurs as a whole were predominately carnivorous, so when theropod traits were eventually recognized on the *Therizinosaurus* fossilized arms, it was assumed the big scythe-shaped talons belonged to some kind of huge clawed carnivore. It was a good guess at the time as the group was coincidentally closely related to the Dromaeosauridae, the “Raptor” dinosaurs. This conjured up images of gigantic raptors, with massive talons on the hands instead of the feet, that shredded prey and foe alike. Thankfully more material was later found and some very complete fossils of close relatives which shared the same body shape further cleared up the picture.

And what a strange picture it wound up being. A dinosaur on par with the largest predatory species in size, and yet it was a pot-bellied, wide hipped, upright standing, long necked creature which resembled a elephant sized goose with three scythes attached to its fingers. What’s more, the earlier deduction that this animal came from a family not that far removed from predatory raptors was still entirely

correct but in a way totally unexpected. This was a family of carnivorous animals that gradually shifted to becoming omnivorous and then near totally herbivorous. It's a change that has happened a few times in nature, both with this route and the inverse of herbivores evolving to become carnivores.

The long neck and powerful arms bearing very elongated talons were also initially an enigma, but now it is well supported that these implements were chiefly used to browse high vegetation. The long claws would have assisted in both pulling down tree limbs, but also as defensive weapons if the animal came under attack. The large gut needed to break down large amounts of plant matter and broad body to hold up an upright stance for a long period of time meant that Therizinosaurus and its kin were not particularly fast moving animals. Their defense was to stand their ground and threaten, fight if they had to.

Using its powerful arms to slap, slash, and smack would have made for a formidable defense using the same kinds of muscle movement needed for feeding. This same kind of strong-arm defense system was also seen in the age of mammals with similarly built giant ground sloths and the even more bizarre, clawed cousins of horses called Chalicotheres. To a lesser extent, exchanging large claws for a powerful grip and dexterous hands, a similar body plan and arm use can be seen in gorillas.

This is a case of convergent evolution at work, creating similar, though not exactly the same, body plans in multiple animals of different families if the circumstances were right.

In terms of behavior not much is known about the enigmatic scythe bearers. Fossilized eggs studied in 2007 were determined to have come from a close relative or potential ancestor of Therizinosaurus from a slightly older formation further south of Mongolia into China. Many of these eggs had fossilized embryos inside that were near ready to be hatched when the animals met their unfortunate fate to be buried and later fossilized.

The development of these embryos showing already well-developed limbs indicated that they were not reliant on their parents and were self-sufficient at birth. This isn't necessarily to say parental care didn't exist, but it seems that Therizinosaur babies were not as reliant on their family as some other dinosaurs were.

Additional findings by Dr. Kohei Tanaka and their colleagues in 2013 described the first dinosaur nesting colony in Mongolia, which did belong to a type of Therizinosaur. It seems like some birds and to a lesser extent gharial crocodilians, Therizinosaurs would often nest together for mutual safety. The eggs were covered up in decaying plant material like in an alligator nest, which would've provided a lot of heat without the need for brooding directly by the parent. Likely on account of the adult being so large that they would risk crushing the eggs if they sat on them.

The lack of adults found buried with the nests as well as most of the clutches having hatched already before the rest were covered up and sediment, suggest that Therizinosaurus may not have been very social animals outside of this nesting season. After making their nests and probably guarding the eggs for long enough, most of them would move off with the independent offspring able to take care of themselves with less need of protection.

This isn't to say or speculate necessarily that Therizinosaurus was a solitary animal, just that it might not have been living in large herds. Like some large herbivores today such as hippos and rhinos, it might've been comfortable both completely alone and in a traveling group.

The portrayal of Therizinosaurus in the story was both made to conform to this possibility, but also intentionally subvert a few of the tropes that have been associated with the animal ever since it started making appearances and pop culture. Even before the appearance of the animal was known in life from more complete fossils, Therizinosaurus was often typecast as an extremely aggressive animal. From the Playstation game *Dino Crisis* having it as one of the most dangerous enemies in the game (while sporting the outdated, carnivorous raptor-like look), to the numerous appearances as an antagonist in the South Korean *Tarbosaurus* focused series like *Dino King*; and its recent starring role in *Jurassic World: Dominion* has a cantankerous animal that will lash out at anything that gets near it.

The large size of the animal being intimidating and its massive claws, creating many a comparison to the taloned glove of the villainous Freddy Krueger of the *Nightmare on Elm Street* series, both certainly contributed to this. Therizinosaurus has a body plan very atypical of a large predatory theropod so it makes a handy counterpart that is visually very different for a dramatic confrontation, which no doubt helps for the audience in distinguishing who's who for cinematic appearances or battles.

Temperament however is something that can vary drastically, even between closely related animals. However it is true that solitary animals, contrary to what some would think, tend to be less aggressive than social animals. In the case of herbivores, the reasoning can make a lot of sense when you think of defense. An overly aggressive solitary herbivore that picks too many fights is probably going to wind up getting seriously injured eventually. And with no herd to offer a defense by proxy, or at least more bodies to put between them in a predator, being alone and injured is not something you want to be.

So while we may not know the exact temperament of *Therizinosaurus*, a more docile and reactive behavior is quite plausible and arguably more likely than the overly aggressive portrayal.

This isn't to say it was safe to be around, all animals are capable of lashing out. But let's also consider that the protagonist of our story is several orders of magnitude

smaller than the adult *Therizinosaurus* who appears and is not a competitor for food. One *Adasaurus* is not a threat and barely worth notice to someone who probably has more weight in a single hand than Ruby did in her whole body.



*Deinocheirus mirificus* by Cheyenne Grier

**Name:** *Deinocheirus mirificus* (Dine-no-kai-rus mir-rif-fi-cus)

**Name Meaning:** The Horrible Hands that are Unusual

**Family:** Ornithomimosauria (“Bird-Mimic Dinosaurs”)

**Height:** 4 meter

**Length:** 11.5 meters

**Mass:** 6,500 kilograms

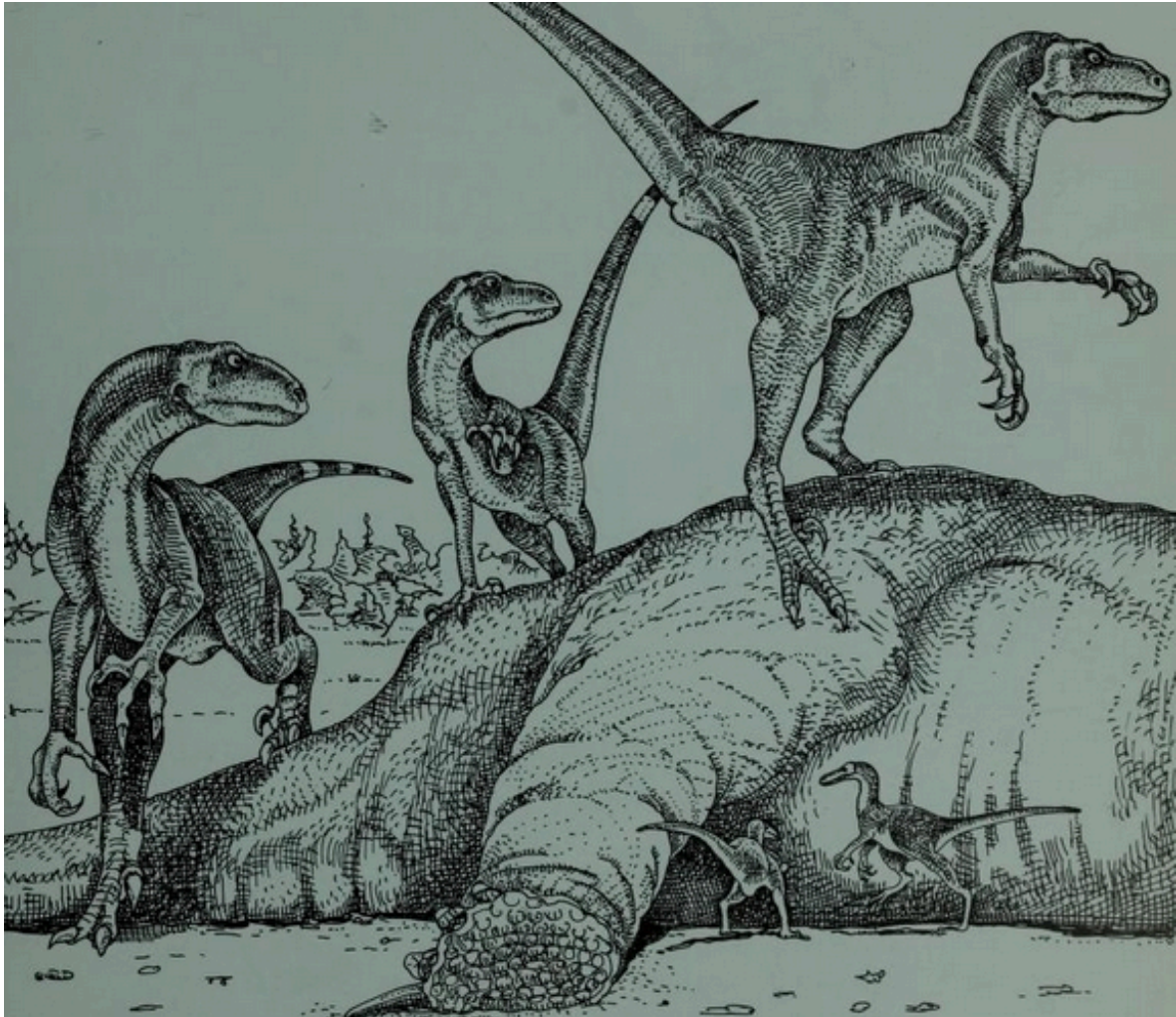
It seems perhaps more than coincidence that another one of the “Enigma Dinosaurs” which spent decades being known of but not truly known well would also come from Mongolia and be contemporaneous with *Therizinosaurus*. Uncovered by one of the first woman led paleontological expeditions in the 1960s and named *Deinocheirus mirificus* in 1970, this animal having a name referencing its unusual giant arms couldn’t have been a more fitting choice by its discoverers. In a fate very similar to *Therizinosaurus*, *Deinocheirus*’ initial remains consisted almost exclusively of its arms and shoulders.

There was enough material to ascertain pretty quickly that this was a theropod dinosaur. And given theropods at the time were thought to be near exclusively carnivorous, this quickly led to very similar assumptions that the gigantic arms over 2 meters long belonged to some sort of predator.



The *Deinocheirus* holotype specimen's initial remains,  
from "Dinosaurs. Treasures of Gobi Desert" in CosmoCaixa, Barcelona.  
(Photographed by Eduard Solà for Wikipedia, used with Creative Commons License  
<https://creativecommons.org/licenses/by-sa/4.0/legalcode>)

Later review of the few remains present indicated that while this animal was of the theropod dinosaur family and a huge one at that, subtle details in its arms and hands showed it was closely related to the much more complete but seemingly innocuous Ornithomimosaurs like *Gallimimus*. Often called ostrich dinosaurs or bird-mimic dinosaurs, these were chiefly swift moving, lean built, moderate sized omnivores or herbivores as the then-known exception to the rule of theropods being predators.



*Deinocheirus* imagined as a giant, pack hunting raptor; indicative of how it was often seen from the best data at the time. Taken from John C McLoughlin's *The Tree of Animal Life: a Tale of Changing Forms and Fortunes* (1981)

As some of the first theropods recognized as not chiefly being predatory, this group's members really did look quite a lot like an ostrich in life with their long necks for plucking at the ground and long legs for running swiftly. Still, nobody could have predicted what the final body would look like when more material was at last discovered.

In 2012, an expedition by Doctors Phil R. Bell, Philip J. Currie, and Yuong-Nam Lee managed to uncover not only more skeleton material from the same species, but backtracked to the location of the original skeleton using the field notes of the 1960s expedition. After half a century, the remains of the exact same individual had been finally uncovered. Additional fossils of the same species were also brought to light, including in the most unexpected of places when it turned out the skull and part of the limbs for another individual had been illegally

smuggled out of Mongolia and into Europe. Mongolia considers its fossils a national treasure and fossil poachers have regularly destroyed numerous fines seeking big payouts selling teeth, claws, and skulls to collectors.

Thankfully the skull and other parts were tracked down and returned, allowing them to be studied and at last finalize the picture of what the blue blazes this creature looked like. And the resulting picture was arguably even stranger than for *Therizinosaurus*.

*Deinocheirus* was not only the largest member of its family by an order of magnitude, rivaling the largest predatory dinosaurs for size, compared to the next largest Ornithomimosaur being roughly the same mass as a large bison, but its general body shape was also extremely unique for its family. Instead of a sprinter's athletic build for running, this animal was built robust with thick legs and wide feet for stability. The dorsum about halfway down the spine was raised upwards to form a muscular or fatty hump on the back. The tail ended in a type of bone called a pygostyle which would have supported a type of feathery fan similar to those on bird tails. And the face could be favorably compared to a cross between a widened beak of a goose and duck elongated to the span of a pelican's bill.

A humpbacked, big armed, elephant sized pelican with a broad face and tail fan. It's safe to say nobody saw this coming as nothing like it had been found up to that point.

The shape of the skull with a very broad bill and deep lower jaw was a good indicator that this animal spent a lot of time near bodies of water slurping up aquatic plants. Gastroliths, stones swallowed and held inside the stomach or a crop in many types of dinosaurs and birds, also show the presence of fish bones. Whether this was a part of the regular diet or just accidental ingestion scarfing down large quantities of river plants, no one could really be sure at the moment. But together alongside the broad feet and large legs do support the assessment this was a river dweller, though it might not have been a watery exclusivist and was perfectly capable moving around on land quite well.

Still, even despite their large size, *Deinocheirus* was not without its threats. Several of the specimens sported healed trauma and bone

remodeling indicating they either had gotten into a confrontation or had survived an attack. The original specimen's body was also discovered to have telltale teeth marks indicating it was bitten and probably fed upon by a *Tarbosaurus*. Whether this was an individual scavenging off an already dead *Deinocheirus* or if the tyrannosaur hunted down the large armed giant, alone or in a pack, can't be determined precisely. It's probable that either scenario would've happened at some point or another.

Ornithomimosaurians were known to be social animals, and while larger animals tend to be more solitary it's not impossible for them to mingle with their own kind. And this can result in both placid and violent interactions involving both reaction to and competition for mates and food resources. As some of the largest animals in the ancient Mongolian ecosystem, but still ones that could be potentially threatened, I drew upon contemporary large mammals as a point of reference when creating the story's depiction of *Deinocheirus*. The healed trauma on the hands of one individual showing some kind of violent use or injury as well as the behavior of animals like water buffalo, hippos, and elephants was employed.

Additionally, during mating season it is not at all uncommon for male, female, and sometimes both sexes in certain species to become much more aggressive than they otherwise would be. Birds and crocodylian males might aggressively defend a certain territory, running out intruders of both their own kind and competitors. Similarly, it is not uncommon for mammals and birds to experience a sort of hormonal surge during mating season that amplifies certain hormones like testosterone. This can be seen in male deer and elk entering a state called rut, and to a similar degree male elephants experiencing a state called musth.

Perhaps the exact same individual *Deinocheirus* featured in the story might have been significantly less aggressive during other times of the year. But, in nature it is not at all unusual for large herbivores to be some of the most violent and aggressive animals in their ecosystem if conditions are right. It's been well documented that especially hormonal surges can cause certain large herbivores to go as far as attacking and killing other animals unprovoked. This side of nature is almost never portrayed in media featuring dinosaurs, especially with dinosaurs that may not traditionally look intimidating and scary like sauropod dinosaurs

or hadrosaurs. Or in this case, making the “Horrible Hands” live up to their name despite their diet.

A battle between a *Deinocheirus* and *Therizinosaurus* is a product of speculation, as is who would be the aggressor in the confrontation. But the two animals were contemporaneous to each other, were of similar size, and did have overlap in both habitat and diet. A 2010 study by Dr. Senter Phil and Robin James found that the two animals, while specializing perhaps in different kinds of plants, were each other’s primary competition for where their diets and ranges overlapped. It could be that both of their long necks and giant arms were employed in similar feeding strategies from time to time. And even if their specialties might have differed, that doesn’t exclude competition and aggression. Hippopotamus and white rhinoceros have many well-documented confrontations with one another in the wild, and that sort of motif of two giant herbivores getting into a battle was employed here, using two that could have feasibly bumped into one another on a regular basis.

The sort of herbivore versus herbivore confrontations, lethal and nonlethal, are rarely portrayed in fiction despite being much more common than instances of large predators battling it out. It also well typifies the sheer bizarreness in dinosaurs that many of the public takes for granted; showcasing two of arguably the weirdest species ever that could have crossed paths coming to blows.

Still it was important to play the battle realistically, even if I couldn’t resist a few cheeky nods to giant monster battles from Kaiju films. Ruby as the small predator getting caught in the melee of two battling herbivores was directly inspired by another fossil find involving two mammalian megafauna. A fossil site from Nebraska showed a confrontation between two male Columbian Mammoths had been battling it out much like hormone addled elephants do today. The two combatants accidentally killed each other in a fall, accidentally crushing a coyote spectator at the same time.

Still, this would have been a fluke instance and most of the time, battles like this don’t have such consequences. Not only does neither combatant wind up killing each other, as battles can resolve non-lethally even if the fighting is vicious, but even the irate *Deinocheirus* doesn’t pointlessly continue once circumstances change. An adult *Tarbosaurus* could

potentially threaten it on a good day; so when it smells the territory markings of one while already being wounded fighting the *Therizinosaurus*, the “River King” has no reason to stick around. Likewise, the *Therizinosaurus* didn’t even want conflict to begin with and was only defending itself, so it left soon after.

In this way they still act like animals, not monsters; while still providing a dramatic sequence.

And here is a final piece by Sumair Syed, depicting the colorful cast of the story in reference to size with each other.



**I hope you enjoyed the story! With luck, this will be the first in an anthology to entertain and educate for years to come. If you enjoyed the tale and its science, and/or you have a remark to say on the matter, please do leave me a review on Amazon! It really helps me keep track of critiques and to help others find and judge the book for themselves.**

# RECOMMENDED FURTHER READING AND VIEWING -

If you would like to learn more about Mesozoic Era life like dinosaurs, there are some good books out there that not only contain a wealth of knowledge and good sourcing for their facts, but also articulate them in a way that is approachable by both scientifically experienced and the layperson alike.

For those who like visual media, the recently released BBC and Apple+ 2022 series, *Prehistoric Planet*, does a wonderful job showcasing how diverse, unexpected, and at times bizarre animals from the end of the Cretaceous Period could be. While the perspective does jump around a bit to cover many different groups, the effects are nothing short of spectacular and the research is rock solid. If you wanted to see a modern nature documentary with dinosaurs and company rendered photorealistically to the degree one might wonder if someone stuck a camera through a literal window to the past to film such beasts, here's your ticket.

While this story was principally written before the fantastic *Prehistoric Planet* was released, I can't deny a lot of shared DNA per se due to a lot of influence coming from the book several of the consultants worked on prior, *All Yesterdays*. A critiqued problem in paleontology themed media is stagnation in the portrayal of a very simplistic past, whereas in all probability prehistoric animals looked and behaved every bit as unexpectedly, bizarre, and diverse as modern fauna.

*Dinosaurs and Prehistoric Life: The Definitive Visual Guide to Prehistoric Animals* from 2019 by DK publishing is a great buy or library rental for anybody who is a visual learner in literary form. The book is a collaboration with the Smithsonian Institute and is packed front to back with digestible text and ample illustrations about dinosaurs themselves and other prehistoric beasts before and hence their time. While perfectly approachable by children, I find the presentation appreciable by many ages and it does a fantastic job not only showcasing the animals in detail but also breaking down how scientists throughout the decades discovered what they have. If you'd like to know about how some mammoths wound up preserved as permafrost mummies, how feathers evolved across the dinosaur family and why, or how we can even tell what color certain bygone beasts were; this isn't a book to miss.

Gregory S. Paul's *The Princeton Field Guide to Dinosaurs* is also a great source if one is wanting to delve into specific species instead of broader topics covered in the DK book. The second edition came out in 2016 and has quite an extensive species list in its listing with illustrations, diagrams, and summarized findings for each. Paul is a long time veteran in the field, especially for artistically rendering the animals in question; which can be just as important in distilling the animals into the public consciousness as the scientific work discovering and studying such beasts. Paul helped pioneer the rendition of dinosaurs and pterosaurs as active, warm blooded, and feathered since the 1970s and he continues the good work in this book.

And if one wants to get the words right from the source, Paleontologist Dr. Steve Brusatte has provided. Dr. Brusatte and his colleagues have been involved in the discovery and classification of over a dozen fossil species, ranging from fossil fish, to pterosaurs, to marine reptiles, to a new

variety of tyrannosaur closely related to the *Alioramus* featured in the story. He's also had a close hand in science education and bringing that kind of knowledge to the public, having been the scientific advisor for the 2013 *Walking with Dinosaurs* movie and 2021's *Jurassic World: Dominion*.

Dr. Brusatte has also published several books specifically with the mind of educating and summarizing in-depth knowledge for people who don't want to wade through a potential roadblock of jargon talk. *The Rise and Fall of the Dinosaurs: The Untold Story of a Lost World* from 2019 and its 2021, more child oriented companion, *The Age of Dinosaurs: The Rise and Fall of the World's Most Remarkable Animals*, are both great resources to draw from for the curious and wanting something straight from the source. If one is looking for a literary starting point with a lot of meat to the text to annotate how discoveries were made, what they mean, and have it broken down group by group across the dinosaur families; Brusatte's work is an excellent beginning.

If one also wishes to see some of these ancient beasts brought to visual life, there are many great paleoartists to look towards. One I highly recommend is the work of Fred Wierum, who has had his designs of various creature and dinosaur designs used in everything from films, books, television, and even wikipedia articles. Many of the designs for the creatures referenced his work as a basis and they are a delight to behold for both their visual distinctiveness and accuracy.

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