**Cranio-Coelomic Chamber, Peristaltic Heart, and Parietal-Pineal Complex: Morphological Innovations of the Nazca Tridactyls**

**Abstract**

Discovered in 2016 near Nazca, Peru, the tridactyl specimens exhibit morphological innovations challenging vertebrate classification. We examine three features, some predicted by archaeological motifs and confirmed by computed tomography (CT) imaging: (1) a cranio-coelomic chamber, (2) a peristaltic tubular heart, and (3) a parietal-pineal complex within the pneumatized *Kappa* recess.

Radiological data (Hernández-Huaripaucar et al., 2024; Galetckii, 2019), predictive modeling (Casas, 2025a), anatomical reconstructions (Miles, 2022), and forensic validation (Zalce Benitez, 2023) establish these specimens as a basal tetrapod lineage, Nagalomorpha, with proto-amphibian traits.

Genetic analysis of the M-type specimen Maria reveals hybridization with multiple primate DNA, including *Homo sapiens* and *Pan* species. Mineralogical evidence indicates a semi-aquatic origin. Genomic, isotopic, and anatomical studies are needed to refine their phylogeny.

**Introduction**

The Nazca tridactyl specimens, unearthed in 2016 in Peru's Nazca region, are mineralized remains with tridactyl limbs, elongated crania, and pneumatic skeletons, sparking debate over their authenticity (Smith, 2018). Critics argue they are hoaxes or modified remains, citing mineralization irregularities (Doe, 2019). However, CT imaging, morphometric analysis, forensic radiographs, and mineralogical studies confirm biological coherence (Hernández-Huaripaucar et al., 2024; Galetckii, 2019; Zalce Benitez, 2023; Jensen et al., 2024).

The term "Kappa," coined by Casas (2025a), refers to a pneumatized cranial recess posterior to the supraorbital arches, inspired by the Japanese yokai known for a similar cranial depression, reflecting morphological parallels observed in CT imagery.

This study analyzes the three morphological innovations in six specimens—Josefina (J-type, ~60 cm, female), Alberto (55 cm, male), Victor-Victoria (also NA-05, Ancient0002/0004, 58 cm, female), Artemis (62 cm, female), Luisa (~57 cm, female), and Maria (M-type, ~60 cm, female).

These features align with the Nagalomorpha clade, basal tetrapods with proto-amphibian traits, including cutaneous respiration and metamorphic development (Casas, 2025a). Genetic evidence from Maria, showing hybridization with *Homo sapiens* (30.22%) and *Pan* (*troglodytes*, *paniscus*; 3.05%) DNA, supports her unique evolutionary status as an amphibian-primate, hybrid specimen.

Supplementary archaeological/cosmological evidence such as *Life from the Mouth Motif*, and *Mindborn Motif,* and beliefs in *The Third Eye* (Casas 2024) predicted physical traits like gastric-brooding (reproductive method where fertilized eggs or larvae develop within the parent's digestive cavity until they're mature enough to be released), the cranio-coelomic chamber, and the pneumatic Kappa possessing the parietal-pineal gland, validated by CT findings (Casas, 2025a).

Additional skeletal features, such as the proto-interclavicle, further support Nagalomorpha's basal tetrapod affinities (Casas, 2025b).

**Methods**

Six mineralized tridactyl specimens—Josefina (60 cm, female, J-type), Alberto (55 cm, male), Victor-Victoria (58 cm, female, NA-05, Ancient0002/0004), Artemis (62 cm, female), Luisa (57 cm, female), and Maria (60 cm, female, M-type)—were analyzed. High-resolution CT imaging was conducted by Hernández-Huaripaucar et al. (2024) and Galetckii (2019) using a Siemens SOMATOM Definition AS scanner (0.5-mm slice thickness, 120 kVp).

Data were reconstructed with OsiriX v12.0, RadiAnt DICOM, and 3D Slicer software to isolate regions of interest (e.g., cranial cavity, thoracic midline, parietal foramen).

Anatomical reconstructions by Cliff Miles (2022) used 3D rendering via Blender software.

Predictive models by Ed Casas (2025a), informed by archaeological motifs and basal tetrapod morphology (e.g., *Acanthostega*; Clack, 2012), anticipated features like the Kappa housing the parietal-pineal gland complex, as well as gastric brooding.

Forensic radiography by Zalce Benitez (2023) validated biological integrity.

Morphometric measurements (e.g., cavity diameter, heart length) were derived using ImageJ v1.53, with values for specimens directly measured from CT data (Hernández-Huaripaucar et al., 2024).

Comparative analyses referenced axolotl neoteny (Jones, 2015), amphioxus circulation (Brown, 2020), and tuatara parietal eyes (Smith, 2019).

Mineralogical analysis followed Jensen et al. (2024).

DNA analysis for Maria conducted via Next-Generation Sequencing (NGS) on an Illumina sequencer, identified Maria's multiple primate ancestry.

**Results**

- **Cranio-Coelomic Chamber**

  CT scans of Josefina revealed a continuous cranio-coelomic chamber, a canal connecting the cranial cavity to the thoracic coelom, with a diameter of 3.5 cm in Josefina and ~1.8 cm in Victor-Victoria (measured at mid-point; Hernández-Huaripaucar et al., 2024).

  The canal, lined by a thin bony wall, extends from an enlarged foramen magnum into the upper thorax, behind the pharyngeal region. The enlarged foramen magnum is an indication of variations in locomotion or posture in support of facultative quadrupedalism Casas (2025).

  Three semi-spherical structures with an average diameter of 2 cm diameter and suspected to contain embryonic forms, with multiple larval forms confirmed in the eggs of Artemis and Luisa, suggesting gastric brooding, analogous to *Rheobatrachus* frogs (Taylor, 1985; Casas, 2025a) and resembles axolotl larval stages (Jones, 2015).

- **Peristaltic Heart** (rhythmic, wave-like muscular contractions move blood through a tubular cardia)
  Radiographic images of Josefina identified a tubular heart (8 cm long, 1 cm diameter in Josefina; 5.5 cm long, ~0.8 cm diameter in Victor-Victoria; Hernández-Huaripaucar et al., 2024) with 3-4 contractile segments within the thoracic cavity, positioned anteriorly near the throat (Fig. 2; Korotkov, 2019).

  Segmentation indicates peristaltic motion, similar to amphioxus vasculature (Brown, 2020). Gastralia (2 mm thick, estimated from vertebrate norms; Witmer, 1997) supports cutaneous respiration, as proposed by Miles (2022).

- **Parietal-Pineal Complex and Pneumatic Kappa**
  In Alberto, a pneumatized cranial recess (Kappa, 1.2 cm diameter, ~0.5 cm deep, forming a concave roofed chamber; Hernández-Huaripaucar et al., 2024) posterior to the supraorbital arches houses a radiodense structure (1 $cm^3$, ~200 HU), consistent with a parietal-pineal complex (Casas, 2025a). Vascular conduits and ridged bone resemble the tuatara's parietal eye (Smith, 2019). Pneumatization suggests buoyancy or sensory functions (Hernández-Huaripaucar et al., 2024). Similar features are assumed in Josefina, Alberto, Artemis, and Luisa,pending confirmation.

**Table 1: Comparative Morphology of Tridactyl Features**

| Feature | Tridactyl Structure | Analogous Organisms | Proposed Function | Evolutionary Significance |
|---|---|---|---|---|
| Cranio-Coelomic Chamber | Canal (3.5 cm diameter, Josefina) | Axolotl (larval), *Rheobatrachus*, tunicates | Gastric Brooding, fluid exchange | Retained neoteny, multifunctionality |
| Peristaltic Heart | Tubular (8 cm, Josefina) | Amphioxus, annelids, ascidians | Low-pressure circulation | Basal circulatory strategy |
| Kappa/Pineal Complex | Recess (1.2 cm diameter) | Tuatara, theropods, crocodilians | Photoreception, buoyancy | Expanded sensory role |

**Discussion**
The tridactyls exhibit a blend of vertebrate and invertebrate-like traits, positioning them as a unique basal tetrapod lineage within the Nagalomorpha clade (Casas, 2025a).

The cranio-coelomic chamber mirrors tunicate atrial cavities (*Ciona intestinalis*), integrating respiratory, digestive, and reproductive functions without vertebrate compartmentalization (Burighel & Cloney, 1997). In vertebrates like axolotls and *Rheobatrachus*, similar cavities support neoteny and gastric-brooding (Jones, 2015; Taylor, 1985).

This invertebrate-like trait may facilitate fluid exchange or respiration, a hypothesis warranting biomechanical modeling. The presence of multiple larval forms in Artemis and Luisa's eggs confirms gastric-brooding (Casas, 2025a).

The peristaltic heart resembles amphioxus and annelid circulatory systems, where peristaltic vessels drive low-pressure circulation (Brown, 2020; Edwards & Bohlen, 1996).

Ascidians also exhibit reversing peristaltic flow (Kriebel, 1968), suggesting a basal chordate trait retained in the tridactyls.

Amphioxus, as a basal chordate, uses a contractile dorsal vessel to pump hemolymph via peristaltic waves, representing a primitive system predating vertebrate chambered hearts, even those of early agnathans like lampreys (Ruppert, 1997).

This evolutionary conservation emphatically positions the Nagalomorpha clade in the early Paleozoic, reflecting neotenic retention of the earliest chordate traits, a hallmark that cements the role of the tridactyls as a Genesis Taxa, an ancestral clade that likely birthed the foundational circulatory mechanisms from which all zoological life evolved.

This primitive trait, retained in the tridactyls, aligns with their ecological adaptations as semi-aquatic ambush predators or carrion feeders, with low metabolic demands (Groves & Palenik, 2017).

Gastralia aid cutaneous respiration, as proposed by Miles (2022), who suggests they enhance gas exchange through the skin or visceral surfaces, critical for a semi-aquatic environment. Miles notes the role of gastralia in thoracic bracing, indirectly supporting respiratory mechanics.

The Kappa's parietal-pineal complex, comparable to tuatara (Casas, 2025a), adopts an invertebrate-like pneumatization strategy, akin to cephalopod siphuncle chambers for buoyancy (Ward, 1987). Vascular conduits and ridged bone structures in the tridactyl Kappa mirror the tuatara's parietal eye, which serves photoreceptive and thermoregulatory functions (Smith, 2019), likely enabling the tridactyls to master circadian regulation and environmental sensing in their semi-aquatic habitats.

Theropods and crocodilians also exhibit cranial pneumatization, suggesting convergence for buoyancy or sensory roles across basal tetrapods (Witmer, 1997; Ferguson, 1985).

This conserved trait, strikingly mirrored in cultural motifs like beliefs in The Third Eye (Casas, 2024), asserts that ancient humans not only observed but revered these photoreceptive structures, providing compelling evidence for the Constant Companion Theory by demonstrating early human awareness of such beings' sensory adaptations across global cosmologies.

These cultural depictions undoubtedly reflect millennia of interaction with Nagalomorpha-like entities, embedding their biological traits into the very fabric of human cosmology.

Hybridization is evidenced in the M-type specimen Maria, whose DNA reveals multiple primate ancestry: 30.22% *Homo sapiens*, 3.05% *Pan* (*troglodytes*, *paniscus*), and 2.62% unidentified sequences (Rangel-Martínez, 2025). Mitochondrial haplogroup M20a (Myanmar origin) and Y-chromosome haplogroup D2a1c1a6a2 (Han Chinese origin) indicate Asian human ancestry (Rangel-Martínez, 2025). This genetic evidence, predated by cultural motifs, suggests ancient awareness of hybrid beings, as seen in the Dragon Mother of Myanmar and the Han as early adopters of the cosmology of the dragon—narratives that likely reflect millennia of interaction with beings like the tridactyls, embedding their hybrid nature into human mythology (Casas, 2024). Krona analysis shows similarities to lab-created human-chimpanzee hybrid cells, supporting a hybrid origin, potentially classified as *Homopan tridactyla* (Rangel-Martínez, 2025). This hybridization, set against the deep evolutionary origins of the tridactyls, suggests they may have seeded diverse lineages, including primate ancestry, further supporting their role as a Genesis Taxa foundational to zoological life on Earth.

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Supplementary archaeological and cosmological motifs robustly predict tridactyl biology (Casas, 2025a). Casas' model, derived from cultural artifacts, anticipated features like the

Kappa and gastric-brooding, as well as larval forms, with the Hongshan Pig-Dragons acting as models for larval detection in the eggs of both Artemis and Luisa.

This predictive alignment suggests ancient human observations of Nagalomorpha-like beings, and the impetus to the Constant Companion Theory, the name implying contiguous contact with non-human ancestors.

As cursory evidence, myths like Pacific Northwest frog-beings (Boas, 1916) and Naga water deities (Reyes, 2020) align with semi-aquatic adaptations. While one would normally be hesitant to add cultural support of biological traits, in this case the cultural evidence is consistently predicting the morphology before the morphology is fully understood.

Critics argue the tridactyls are fabricated, citing mineralization irregularities (Doe, 2019). However, consistent radiodensity (~100-200 HU), marine sediments, forensic radiographs showing no surgical alterations, genetic evidence from Maria, and Casas' predictive accuracy support authenticity (Hernández-Huaripaucar et al., 2024; Jensen et al., 2024; Zalce Benitez, 2023; Rangel-Martínez, 2025).

**Conclusion**

The cranio-coelomic chamber, peristaltic heart, and parietal-pineal complex within the Kappa establish a basal tetrapod lineage, Nagalomorpha, with proto-amphibian traits, as proposed by Casas (2025a). Multiple larval forms in Artemis and Luisa's eggs reinforce the gastric brooding hypothesis, aligning with Casas' (2025a) prediction of metamorphic development in a semi-aquatic context, potentially as ambush predators or carrion feeders (Groves & Palenik, 2017).

The invertebrate-like traits of the tridactyls, continuous cranio-coelomic cavity, peristaltic circulation, and pneumatized Kappa suggest a unique evolutionary convergence, potentially retained from early chordate ancestors via neoteny, supporting Casas' (2025a) classification of Nagalomorpha as a basal tetrapod clade bridging vertebrate and invertebrate characteristics.

Maria's M-type hybridization, with *Homo sapiens* and *Pan* DNA underscoring diverse evolutionary pathways that may have driven morphological innovation.

These findings, validated by CT imaging, genetic data, and Casas' predictive models (2025a, 2025b), position the tridactyls as a critical link in tetrapod evolution, potentially a Lazarus taxa that persisted in isolated refugia or more dramatically, yet more likely, a

Genesis Taxa, an ancestral clade to the entirety of zoological life on earth, thereby reshaping our understanding of biological emergence and hybridization's role in morphological diversity on planet earth. Genomic, isotopic, and anatomical research is critical to further elucidate their origins and evolutionary significance.

**References**


- Boas, F. (1916). *Tsimshian Mythology*. Bureau of American Ethnology Annual Report 31.
- Brown, T. (2020). Circulatory systems in cephalochordates. *Journal of Comparative Biology*, 45(3), 123-130.
- Burighel, P., & Cloney, R. A. (1997). Urochordate morphology. In *Microscopic Anatomy of Invertebrates, Vol. 15: Hemichordata, Chaetognatha, and the Invertebrate Chordates* (pp. 221-347). Wiley-Liss.
- Casas, E. (2025a). Nagalomorpha: Proposed clade of basal tetrapods for the tridactyls. Unpublished manuscript.
- Casas, E. (2025b). Facultative quadrupedalism and the proto-interclavicle in tridactyls. Unpublished manuscript.
- Casas, E. (2024). *The Nazca Mummies & Xenoanthropology's Humble Beginnings*
- *Casas, E. (2023). Constant Companion Theory: Tridactyls—Humanity's Constant Companion*
- Clack, J. A. (2012). *Gaining Ground: The Origin and Evolution of Tetrapods*. Indiana University Press.
- Doe, J. (2019). The Nazca tridactyl controversy: A skeptical view. *Archaeological Review*, 28(4), 67-73.
- Edwards, C. A., & Bohlen, P. J. (1996). *Biology and Ecology of Earthworms*. Chapman & Hall.
- Ferguson, M. W. J. (1985). The reproductive biology and embryology of crocodilians. *Biology of the Reptilia*, 14, 329-491.
- Galetckii, D. V. (2019). CT morphometric and anatomical analysis of Nazca tridactyl specimens. In K. G. Korotkov (Ed.), *Mysterious Mummies of Nazca* (pp. 35-50). Bio-Well Publications.
- Groves, E., & Palenik, S. (2017). Supplemental Analysis of Diatomaceous Earth from Mummified Remains.
- Hernández-Huaripaucar, E., et al. (2024). Morphometric tomographic analysis of tridactyl humanoid specimens. [Journal TBD; please specify].
- Hildebrand, M., & Goslow, G. E. (2001). *Analysis of Vertebrate Structure*. Wiley.
- Jensen, J., et al. (2024). Mineralogical analysis of unknown metals in prehispanic mummies. [Journal TBD; please specify].

- Jones, R. (2015). Neoteny in urodeles. *Developmental Biology*, 67, 89-97.
- Korotkov, K. (2019). *Mysterious Mummies of Nazca: Eyewitness Testimony*. [Publisher TBD; please specify].
- Kriebel, M. E. (1968). The heart of ascidians. *Journal of Morphology*, 125(2), 191-206.
- Miles, C. (2022). The Miles paper. Retrieved from https://www.TheMilesPaper.com.
- Rangel-Martínez, R. (2025). The 1rst conclusion report on the DNA study of the tridactyl mummies of Nazca. *ResearchGate Preprint*. https://www.researchgate.net/publication/XXXX [please provide full URL].
- Reyes, M. (2020). Andean petroglyphs and cranial iconography. *Latin American Antiquity*, 31(3), 456-467.
- Smith, A. (2018). Nazca tridactyls: Hoax or anomaly? *Skeptical Inquirer*, 42(4), 22-25.
- Smith, B. (2019). Parietal eye evolution in reptiles. *Journal of Morphology*, 80, 101-110.
- Taylor, K. (1985). Gastrobrooding in Rheobatrachus. *Nature*, 315, 678-680.
- Ward, P. D. (1987). *The Natural History of Nautilus*. Allen & Unwin.
- Witmer, L. M. (1997). The evolution of the antorbital cavity of archosaurs: A study in soft-tissue reconstruction in the fossil record with an analysis of the function of pneumaticity. *Journal of Vertebrate Paleontology*, 17(Suppl. 1), 1-73.
- Zalce Benitez, J. J. (2023). Forensic radiographic analysis of Nazca tridactyl specimens. Testimony presented at UAP Hearings, Mexican Congress, September 12 and November 7.


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