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Ethnocultural Influence On Gecko Adaptability And Conservation

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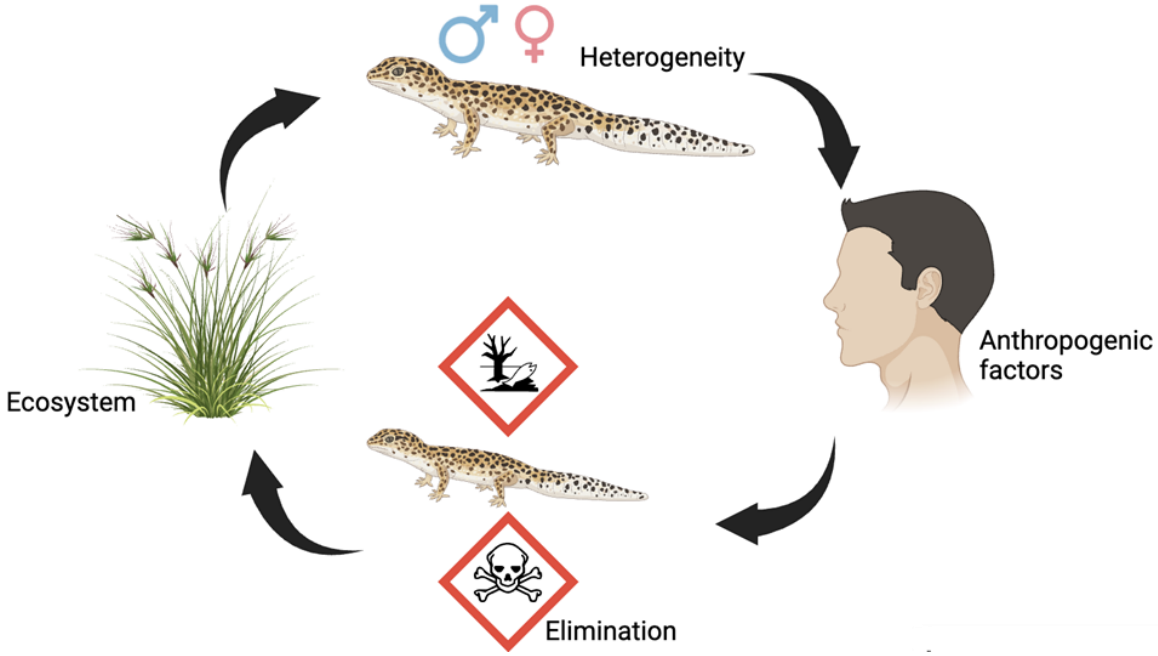
Abstract:
Geckos, particularly West Africa's endemic Ancylodactylus africanus, face extinction threats from anthropogenic and socio-cultural pressures. This study combined community surveys (n=100 Nigerian residents via WhatsApp convenience sampling) with bioinformatics to assess ecological perceptions and genomic conservation. Descriptive statistics revealed 58% considered geckos ecologically valuable, while 44% attributed threats to anthropogenic factors, including cultural beliefs (33% upheld traditions associating geckos with superstitions). Bioinformatics analysis of Gecko gecko using NCBI tools (Genome Data Viewer, BLAST) identified conserved genomic regions, with the RAG1 gene conferring heterogeneity. Notably, mitochondrial cytochrome C oxidase sequences showed interspecies similarity, differentiated by snake-specific nucleotide substitutions, a potential focus for genetic engineering. Comparative data indicated geckos are more socially adaptable than lizards (58% vs. 42%), yet are endangered by human activities. Findings highlight discordance between ecological value perceptions (53% viewed geckos as pests) and conservation needs, exacerbated by cultural practices. The study underscores the role of socio-cultural norms in species vulnerability and proposes molecular investigations into reptile-specific genetic markers to inform conservation.



Keywords: *Gecko, Synteny, Socially habitable, Anthropogenic, Extinction, Ecology, and Evolutionary trend.*

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I. Background:

Gecko As A Food Ecosystem Enabler.

As a nocturnal predator (Case et al., 1994; Perry et al., 2008). The Gecko gecko is an important regulator of insect populations, which has an indirect impact on plant communities and the dynamics of the entire ecosystem (Ceríaco et al., 2011). Studies have revealed that Gecko gecko primarily preys on a variety of insects, including cockroaches, spiders, crickets, moths, and other geckos (Henkel & Schmidt, 1991; Ceríaco et al., 2011), making it an important component of the food web. The Gecko gecko's ability to regulate insect pests is one of its most important ecological contributions (Bucol & Alcala, 2013). By consuming insects that are considered pests to humans, such as cockroaches and mosquitoes (Weterings et al., 2018), Gecko gecko helps to maintain the balance of insect populations within its habitat. This pest control function is particularly valuable in urban and agricultural settings, where insect pests can pose significant challenges to human health and agricultural productivity. Gecko predation on insects can have cascading effects throughout the food web (Weterings et al., 2018). In addition to its role as a predator, the Gecko gecko also serves as prey for a variety of other animals within its ecosystem (Bauer, 2013). Snakes, birds of prey, larger lizards, and certain mammals are known to feed on the Gecko gecko, highlighting its importance as a source of food for higher trophic levels (Aowphol et al., 2006). This predation pressure plays a crucial role in controlling gecko populations and maintaining the equilibrium of predator-prey relationships in the ecosystem (Downes & Shine, 1998). Research on the Gecko gecko's use of habitat and niche differentiation has shed light on its ecological needs and preferences (Bobrov, 1993). Studies have shown that the Gecko gecko exhibits preferences for certain microhabitats within its range (Bobrov, 1993), such as rocky outcrops, trees, and human-made structures.

Relationship With Other Genera

The Gecko gecko, belonging to the Gekkonidae family, possesses various attributes and features that are typical of geckos all across the globe (Singh & Chaudhury 2016). One of the most notable features shared by Gecko gecko and other gecko genera is their specialized adhesive toe pads, known as lamellae, which allow them to climb vertical surfaces with ease (Uetz et al., 2020). The Gecko gecko exhibits nocturnal behavior, preferring to be active at night (Perry et al., 2008), when temperatures are cooler and predatory risks are reduced, similar to many other geckos. Gecko gecko shares habitat preferences with other gecko genera, often occupying diverse ecosystems ranging from primary and secondary forests to lowlands (Manthey & Grossmann, 1997). Their broad habitat tolerance underscores the adaptability of geckos as a group and their ability to thrive in various environmental conditions (Singh & Chaudhury, 2016). They prey primarily on insects (Kobayashi et al., 2023), utilizing ambush tactics and agile climbing abilities to capture unsuspecting prey. However, the gecko is also susceptible to predators of its own, becoming prey to bigger animals like snakes, birds of prey, and some mammals (Bauer, 2013). Like other gecko genera, they have attracted human interest for their potential medicinal value (Gbogbo et al., 2009). In traditional medicine practices, geckos are sometimes used for their perceived medicinal properties (Wang et al., 2013)

Evolutionary Trends from the Iron Age:

The evolution of humans and their relationship with animals has been deeply intertwined throughout history (Winterhalder & Kennett, 2019). From our early ancestors as hunter-gatherers relying on hunting animals for sustenance to the domestication of animals like dogs, cattle, sheep, and goats in the transition to settled agricultural communities (Gifford-Gonzalez & Hanotte, 2011), animals have played a crucial role in shaping human evolution (Larson & Fuller, 2014). This primal bond not only influenced our hunting skills and tool-crafting abilities but also led to the development of complex civilizations (Wright, 1994), transforming the way we interact with animals and reshaping societies and cultures (Larson & Fuller, 2014). The domestication process marked a pivotal moment in human history, as it brought about new dimensions to our relationship with animals (Russell, 2002). Domesticated animals became integral to human survival, providing food, labor, and companionship, and played a significant role in the rise of complex civilizations (O'Connor, 1997).

Gecko Habitable Nature

Wall geckos, renowned for their adaptability to urban environments (French et al., 2018; Martín et al., 2018), have forged a unique niche alongside humans, finding refuge in the nooks and crannies of human dwellings, buildings, and structures (Meshaka et al., 2004). They can effortlessly scale vertical surfaces, including walls and ceilings, affording them access to shelter, prey, and breeding sites within the built environment (Autumn, 2002). Their nocturnal behavior minimizes direct competition and conflict with humans, as the two species often occupy the same space at different times of the day. Human coexistence with wall geckos is strongly embedded in cultural contexts, where attitudes toward these reptile inhabitants are frequently shaped by superstitions and beliefs (Ceríaco, 2010). In many cultures, wall geckos are benign cohabitants of human spaces, valued for their role in pest control (Bucol & Alcala, 2013), medical and spiritual importance (Gbogbo et al.,

2009). Their presence is often welcomed, with some individuals even considering them to be the souls of buildings (Gbogbo et al., 2009). Across different cultures, wall geckos may be imbued with symbolic meanings and associations (Ceríaco, 2010). Nevertheless, despite their generally positive reception (Ceríaco et al., 2011), occasional conflicts may arise, particularly when wall geckos intrude into living spaces or create messes with their droppings. In such instances, humans may kill them (Ceríaco et al., 2011). Some individuals may not employ lethal control measures because of their perceived harmlessness and beneficial role in pest management (Weterings et al., 2018). The anthropogenic transformation of landscapes has inadvertently created favorable habitats for wall geckos, with urbanization providing an abundance of artificial structures and habitats for colonization (French et al., 2018; Martín et al., 2018). As a result, wall geckos have become emblematic of human-altered ecosystems.

Abiotic Factors Influencing Adaptability

Wall geckos, lizards, and chameleons belong to a larger group of reptiles (Westerhof, 2009), yet they exhibit distinct physiological adaptations, responses to environmental factors, and interactions within ecosystems. Wall geckos possess specialized adhesive toe pads, enabling them to scale vertical surfaces effortlessly (Chan et al., 2006), a trait not observed in most lizards or chameleons. This adaptation aids in hunting prey and seeking shelter within human structures (Autumn, 2002). Lizards, encompassing a diverse range of species, typically have elongated bodies, tails, and limbs adapted for terrestrial locomotion (Brandley et al., 2008; Chong et al., 2022), with some species capable of swift movement (Cieri et al., 2020). Chameleons are known for their distinctive zygodactylous feet, prehensile tails, and highly specialized tongues used for capturing prey (Moulton et al., 2016). Wall geckos, being nocturnal, have a lower body temperature (Meiri, 2019), whereas lizards and chameleons may bask in the sun to regulate their body temperature, using behavioral thermoregulation (Bennett, 2004; Avery et al., 1982; Muñoz & Losos, 2018). Predator-prey relationships vary among the groups; wall geckos primarily prey on insects (Probst et al., 2023), often serving as prey themselves to larger predators such as snakes (Downes & Shine, 1998; Bauer, 2013). Lizards have a diverse diet, with some being herbivorous or omnivorous (Meiri, 2019). Chameleons are known for their long, sticky tongues used to capture prey (Sabry et al., 2015; Moulton et al., 2016), mainly insects (Eason, 1990), while some larger species may also consume small birds and reptiles (Herrel et al., 2000). Wall geckos are often tolerated or even welcomed in human dwellings because of their role in pest control (Bucol & Alcala, 2013), whereas lizards may face persecution in certain cultures (Uyeda et al., 2016). Chameleons, with their unique appearance and behavior, have fascinated humans for centuries, leading to their capture for the pet trade (Goodman et al., 2023) and cultural symbolism in various societies (Carpenter, 2003).

II. Methods:

A structured questionnaire was administered to Nigerian residents using convenience sampling to assess community perceptions and experiences regarding Gecko gecko. The survey gathered data on ecological beliefs, observed behaviors, socio-cultural associations, and demographic factors. Descriptive statistics were done using Microsoft Excel. In parallel, synteny and genome-wide analyses of Gecko gecko were conducted using NCBI bioinformatics tools (Genome Data Viewer, BLAST) to examine genomic characteristics. Questionnaire results were interpreted alongside genomic data from NCBI and existing literature to assess our hypothesis.

III. Results:

Bioinformatics Analysis of Wall Gecko, Comparison of Similarity in Homology with Lizard and Related Species.

Evolutionary trends in the most susceptible organisms prone to extinction are vital to determine the various genes necessary and required to aid an organism`s proliferation, adaptation, and development. Reverse genetics has identified ways by which genome analysis and identification of the function or role of a gene through specific nucleotide replacement or substitution (also called point mutation) or phylogenetic search through sequence alignment to other homologs or organisms.

The common house wall gecko (Hemidactylus frenatus), also known as chichak “onomatopoetically,” has ecologically evolved but is currently threatened by anthropogenic factors and abiotic conditions. Fulgione et al (2019 stated that the variation and differences between diurnal and nocturnal geckos have enhanced speciation attributed to genome-wide analysis of mtDNA (Mitochondrial DNA) of species. Genome analysis in reptiles has different patterns and waves of annotation, as typical highly conserved linkage homology in the ZW chromosome has been reported between geckos on Okinawa Island and avian species (Kawai et al.,2009), suggesting how diverse the spectrum of biological analysis has limited transgenic modifications for the benefit and sustenance of geckos. The heterogeneity and lack of sex determinant markers in the chromosomes have rendered the gecko susceptible to extinction and adverse ecological endangerment.

Sequence alignment can provide clues to the degree of relatedness of organisms conserved in the evolutionary tree by distance gaps and maps to orthologs or homologs. Wall gecko has been identified to possess

the corneous beta proteins (CBPs) gene, which aids their distinct and specific adhesive foot (setae) and enables locomotion and swift mobility even on a smooth plane (Feifei et al., 2020). Generally, the karyotypes of gecko species are conserved (Trifonov et al., 2011), but with increased rearrangement in fusion and fission of Hemidactylus, indicating how uniquely mapped the species ' ancestral karyotype is.

Bioinformatics and phylogeny analysis revealed that the evolutionary relationship of Gecko was highly conserved in consensus nucleotide sequence and shared greater similarity of the $mtCOX_2$ (mitochondrial Cytochrome C oxidase sub-units) with turtles, crocodiles, common lizards, Iguanas, and water monitors. Intuitively, the degree of unrelatedness was specific to the gecko, suggesting that the species divergence might be ancestrally linked to the gecko as the founder and parent stock. The lack of genome annotation for geckos is a hindrance to understandingtheorganism's function and role in the ecosystem, as well as how to conserve species to prevent extinction, which is mainly attributed to anthropogenic and abiotic factors.

10,000 base pairs of comparative whole genome analysis for lizards showed how sequences are distorted when a large range of the genome is sandwiched against when a specific band width is aligned justifying the claim that genes, proteins, and mRNA involved in biological function can be easily modeled in a closed system to decipher how sequence probes affect the function of a protein, structure, and even chromosomal arrangements. The forward and reverse alignment of the whole genome for Sceloporus undulatus (fence lizards) and Podarcis muralis (common wall lizard), similar in morphology to Hemidactylus frenatus, were aligned. The conclusion deduced is that even as organisms share similarity in phylogeny, speciation overtly distinguishes organisms, which can be an interplay of environmental factors and random mutagenesis obtained through evolutionary trends or survival fitness.

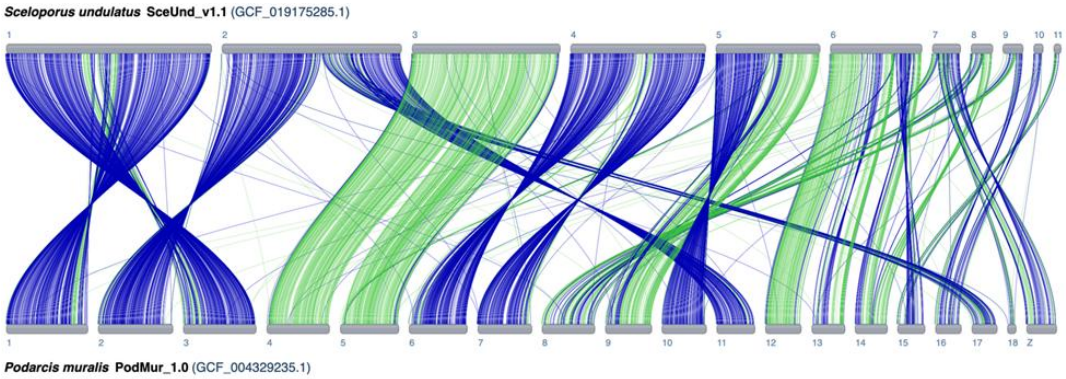

Figure 1: Genome-wide analysis of 10,000 base pairs for two species of lizards.
Forward alignment in green
Reverse alignment in Purple
Base pairs: 10,000.

Biochemical Factors Contributing to The Social Behavior of the Wall Gecko.

The recombination activating gene, also known as RAG 1, has been identified to play a crucial role in enabling sequence-specific DNA binding, ubiquitin protein ligase activity, and double-stranded DNA endonuclease activity.
It is the main component of the DNA recombinase complex and the Endodeoxyribonuclease complex. (NCBI)

Figure 2: locus of the RAG 1 in the chromosome.

Multiple sequence alignment of RAG1 showed high specificity to Gekko gecko compared with other variations in species such as Phelsuma borbonica (Reunion island day gecko), astriata,comorensis, and nigristriata. Although only a few gecko species have been characterized, Parsimony-based ancestral state reconstruction reveals that gekko gecko retained their putative ancestral karyotype through fission and fusion (Trifonov et al.,2011).In addition, the highly conserved feature of the RAG 1 gene could explain their heterogeneity in sex determination, as they possess the ZW and XY chromosomes.

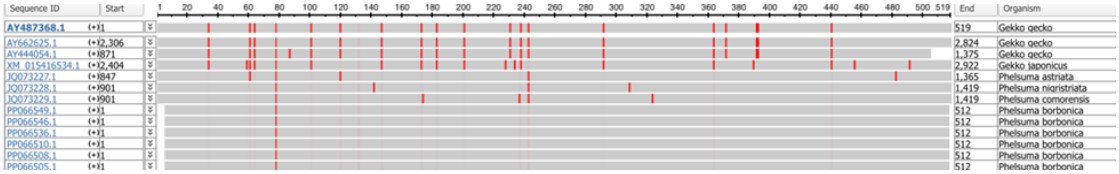

Figure 3: The RAG 1 gene shows high affinity specific to Gekko gecko.

Multiple Sequence Alignment and Conserved Domain Specific to Gekko Gecko.

Mitochondrial cytochrome C oxidase subunit 1 is an enzymatic complex and a component of the electron transport chain, although its molecular function has not been identified in reptiles. Multiple alignment by the constraint-based Multiple Alignment tool (COBALT) unveils the conserved nucleotide shared between the gecko with turtle, crocodile, lizards, iguana, and water monitor. Quite interesting, these sequence similarities are substituted by a single nucleotide for rattle snake, boa constrictor, and rat snake. This raises concern to investigate the function of the gene in closely related Reptilia families other than snakes soon.

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74310509     1 MPYATQLSLQEATGPTMEEVIFLHDHVLMLTFLMTLVIMTFSMTAVTAKLTHNDpTEEVEQLEAAWTAAPIMILILTALP 80
5836006      1 MAHPLQLGFQDAMSPIMEELLHFHDHTLMIVFLISTLVLYIITLMMTTKLTYTN-TMNAQEVEMIWTILPAIVLITIALP 79
197935710    1 MAHPLQLGFQDAMSPIMEELLHFHDHTLMIVFMISAMVLYIIMLMMTTKLTYTN-TMNAQEVEMIWTILPAIVLITIALP 79
5835740      1 MAHPLLLGFQDAMSPIMEELLHFHDHTLMIVFLISTMVLYIITLMMTTKLTYTN-TMNAQEVEMIWTILPAIVLITIALP 79
50659185     1 MAHPFQLGFQDAMSPIMEELHHFHDHTLMIVFLISTLVLYIITLMMTTKLTYTN-TMNAQEVEMIWTVLPAIVLITIALP 79
5835544      1 MANPTHLGFQDAMSPLMEELLYFHDHTLMILFLISSLVFYMIFALLFPKLYYPN-TSDVQEVEVIWTVLPAIVLISIALP 79
27228461     1 MANPMHLGFQDAMSPLMEELLYFHDHTLMILFLISSLVFYMISALLLPKLYHSS-ASDVQEVEVIWTILPAIVLISVALP 79
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108802846    1 MANPMHLGLQDAMSPLMEELLYFHDHTLMIIFLISMFVLYTISVLLLTSLYHTN-ATDVQEMEMIWTILPALILITIALP 79
122891704    1 MANPMHLGLQDAMSPLMEELLYFHDHTLMIIFLISMFVLYTISVLLLTSLYHTN-ATDVQEMEMIWTILPALILITIALP 79
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238866936    1 MPHAGQLSLQEAMGPTMEEVIFLHDHVLLLTCLMTMVITMFTLTATTTTLTHNDpTEEVEQLEAAWTAAPIMILILTALP 80
209886957    1 MPYATQLSLQEAMGPTMEEVIFLHDHVLLLTCLMSLVILMFAVTAITTTLTHNDpTEEVEQLEAAWTAAPIMILILTALP 80
209886985    1 MPYAAQLSLQEATSPAMEEVIFLHDHVLLLTCLMSLVILMFAITATTTTLTHNDpTEEVEQLEAAWTAAPIMILILTALP 80

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197935710   80 SLRVLYLMDEINNPHLTIKAIGHQWYWTYEYTDYDNLEFDSYMIPTQDLPNGYFRLLEVDHRMMMPMESPIRMLISAEDV 159
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108802832   80 SLRTLYLMDETTNPCLTIKVIGHQWYWTYEYTDFSQLEFDSYMLPTQDLPQGHFRLLEVDHRMIVPTNSSTRTLITAEDV 159
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14193049    80 SLRILYLMDEINNPHLTIKTLGHQWYWSYEYTDYEDLTFDSYMTPTQDLTPGSFRLLEVDNRMVVPMESPIRMLISAEDV 159
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121582644   80 SLRILYLMDEINNPHLTIKALGHQWYWSYEYTDYEDLMFDSYMVQTQSLLPGSLRLLEVDNHMVVPVTSPTRMLISAEDV 159
238866936   81 SVRSLYLMEEVFNPYLTIKATGHQWYWNYEYSDDAHISFDSYMIQTKDLQNGSPRLLEVDHRMVMPAGLQARIVVTAEDV 160
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209886985   81 SVRSLYLMEEVFDPYLTVKTTGHQWYWNYEYSDGTQISFDSYMIQTTDLLNGSPRLLEVDHRMAVPMGLQVRVVITAEDV 160
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Figure 4: MSA (multiple Sequence Alignment) of mitochondrial Cytochrome C oxidase in Gecko and other Reptilia.

Sociocultural implications of the Gecko gecko in Africa and other regions of the world.

Gecko symbolizes different things in various cultures around the world. Hindus believe that geckos inhabiting the house bring blessings and ensure financial stability (The Spiritual Powers of Wall Geckos: Myth or Reality? 2023), and in some parts of Southeast Asia, wall geckos are associated with fertility and protection (The Spiritual Powers Of Wall Geckos: Myth Or Reality?, 2023)

In addition, within the Thai culture of Southeast Asia, gecko presence in a home is considered a sign of good luck and prosperity (Unlocking Gecko Symbolism: Protection, Luck, and Resilience, 2024). Wall geckos are also believed to possess healing properties in some parts of Africa. It is believed that the presence of geckos can cure diseases of various kinds by using gecko blood, oil, or other bodily secretions as remedies such as skin conditions and respiratory disorders (The Spiritual Powers of Wall Geckos: Myth or Reality? 2023) .

It is noteworthy to understand that some parts of Southeast Asia, Africa ,and Hinduism see geckos in a much more positive and friendly light, whereas some other parts of the world see them in a negative manner.

Some parts of the Khushmaan Ma'aza Bedouin tribe from Egypt's Eastern Desert consider geckos to be poisonous, believing that they can lead to the death of any animal that encounters them. It is also believed by this tribe that the poison of Gecko poison is in its tongue and can be transmitted to humans through contact with kitchen utensils or water supply.

Some Communities in northern India and Afghanistan believe that direct contact with geckos is likely to cause skin diseases and food poisoning Luiz et. al.,2011).

Luiz et. al. (2011) further explained that In Yemen and many other Arab countries, skin diseases are often attributed to a gecko having run over the face of an agonised individual as he or she slept.

While wall geckos hold spiritual significance in certain cultures, there are not globally recognized or universally practiced rituals associated with them. The spiritual practices and beliefs surrounding wall geckos vary greatly depending on the cultural and religious contexts.

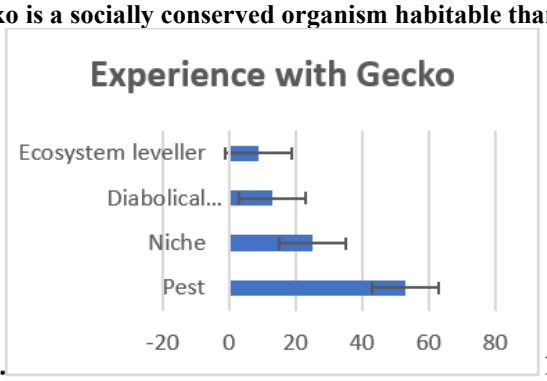
Health-related or therapeutic usage of gecko.

Several journals have been written on the therapeutic use of Gecko, of which the prevalence of malignant tumors is the most spoken of even though pharmacologically active components are not yet known (Yuxia et al., 2017). Gecko is used in Chinese medicine to inhibit inflammation and allergic response, detumescence, and alimentation (Fei et al., 2008). The dosage forms are powder, pill, and mastic. Gecko is mostly used in the treatment of digestive system tumors, especially esophageal cancer, gastric cancer, and liver cancer (Yuxia et.al., 2017: Fei et.al., 2008), and it can either be used independently or in combination with herbs to treat digestive system tumors (Yuxia et.al., 2017).

Several studies have shown the anti-tumor effect of Gecko in several ways, including:

1. Anti-tumor effects of Gecko in vivo and in vitro: induction of tumor cell apoptosis and the downregulation of protein expression of vascular endothelial growth factor (VEGF) and basic fibroblast growth factor (bFGF) may be contribute to the anti-tumor effects of Gecko (Fei et al., 2008) as the immunoreactive score of expression of VEGF and bFGF expression of Cytoxan (CTX) positive group and Gecko groups decreased significantly. This indicates that gecko could decrease VEGF and bFGF protein expression in the tissue of transplanted sarcoma (Fei et al., 2008).
2. Growth curves of EC9706 and EC1 (the growth rate of human esophageal carcinoma cells): (Fei et al., 2008) investigated the anti-tumor activity of Gecko in vitro. They treated the tumor cells with serum medicine ,which were cultured for 7 days, and then the cell growth curve was drawn.By performing this under an inverted light microscope, an obvious difference was observed in the cell morphology among the five groups of cells compared with the control group. The growth curves of the three Gecko groups (M-AG, S-AG, and V-AG; Macromolecular fractions of fresh gecko aqueous extract, small molecular components of gecko aqueous extracts) used gradually decreased in a dose-dependent manner. These results indicated that serum with Gecko could inhibit EC9706 and EC1 growth and proliferation in vitro.
3. Yuxia et al.,(2017) explained the Anti-tumor effects of three fractions (M-AG, S-AG, and V-AG;Macromolecular fractions of fresh gecko aqueous extract, small molecular components of gecko aqueous extracts, Valley part of Gecko aqueous extracts) on H22 hepatocarcinoma-bearing mice, confirming that anti-tumor compounds are macromolecular and induce cell morphology and biochemical indices. M-AG functions are related to ERK1/2 (Extracellular Signal-Regulated Kinases ½) activation Yuxia et al., 2017).

Wall gecko is a socially conserved organism habitable than other genera.



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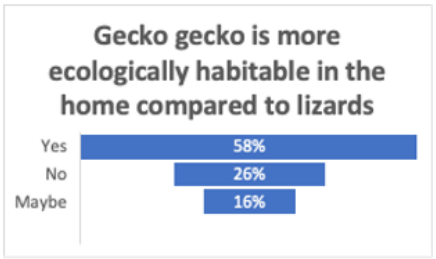

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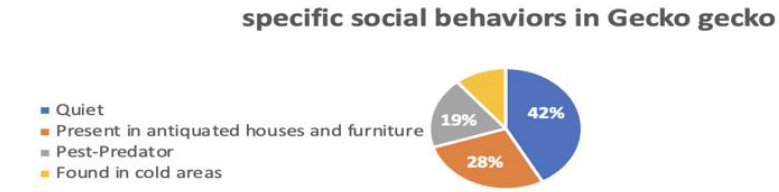

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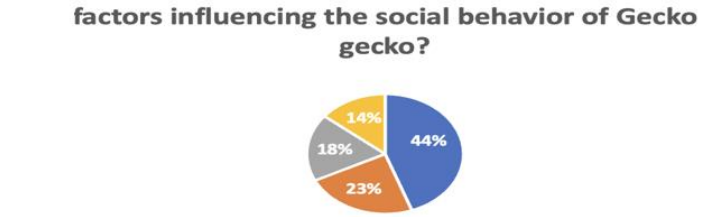

D.

Social and Cultural norms associated with Gecko

E.

Figure 5 **:**Wall gecko as a socially conserved organism habitable than other genera. (a)data showing perception about the biological role of organisms (b) wall geckos are more socially habitable than lizards. (c) Behavioral specificity to organism (d)Possible factors greatly affecting organism`s existence(e) Socio-cultural norms associated with wall gecko.

IV. Discussion:

The majority of the correspondents believe that the Gecko gecko is more ecologically habitable in the home compared to lizards (58%), 53% believe that it is a household pest, and just 13% believe that they have a Diabolical connotation. Concerning the behavior of gecko geckos, 42% believe they are quiet, 28% believe they are present in antiquated houses and furniture, 19% believe they are Pest Predators and 11 % believe they are found in cold areas. Of all the factors that people think influence the social behavior of Gecko gecko, majority think Anthropological factors e.g presence of humans are the highest factor (44%). 37% say they see wall geckos about 2-10 weekly, 28% say 2-10 times monthly, while 17 % say 2-5 times daily.

From the survey, majority of the correspondent agrees that wall gecko is a household pest as 58% of the correspondence believes that gecko is more ecologically habitable in the home compared to lizards, 53% believes it is a household pest and 25% believes it's a household niche, (37%, 28%, 17%) correspondence says that wall gecko is seen in the house 2-10 weekly, 2-10 Monthly, 2-5 times daily, respectively. Luiz et. al., 2011 also agrees with the perspective of some correspondence in this survey by agreeing that wall geckos are useful to humans in their ability to maintain or reduce the number of mosquitoes (i.e feeding on insects including mosquitoes) therefore confirming that 53% of the total correspondence that agrees that wall gecko are household pests. This research further acknowledges the research titled Common wall geckos, which explains that wall geckos can be found in rocky areas, cliffs, rock fields, and on many construction sites, ruins, building walls, and inside houses.

It is quite impressive that 67% do not believe in any traditional or socio-cultural ideology related to the Wall gecko, while 33% believe that the wall gecko has traditional and socio-cultural ideology.This survey proves (The Spiritual Powers of Wall Geckos: Myth or Reality?, 2023) that it is important to remember that these beliefs are subjective and may differ from person to person. This is important because beliefs such as wall gecko are poisonous, cause marks on people, bring bad luck, can cause, or be used to aid killing, and the other perception address in this survey has not been scientifically proven to be correct since the animal does not possess any kind of toxin that causes poisoning or disease therefore, this superstition is completely illogical (Luiz et. al., 2011).

Concerning the endemicity of wall gecko, 42.42% are indecisive as to whether wall gecko is only endemic to Nigeria or Africa, 34.34% believe that wall gecko is endemic in Africa, 5.05% believe wall gecko is endemic in Nigeria, and finally 18.18% think that wall gecko is not endemic in either Nigeria or Africa, however research has shown that the common wall gecko is native to the western Mediterranean area of North Africa and Europe (Common wall gecko, n.d.).

V. Conclusion:

Gekko gecko and its family, with species variation such as Hemidactylus frenatus, are evolutionary conserved ancestors of the reptilia family. The species has been endangered by anthropogenic factors in addition to abiotic factors. The wall gecko is a more social organism that has its niche similar to that of households, furniture, or antique objects.

However, sociocultural norms also juxtapose the lifespan of this endangered species. This research and experiment examines the role of human factors in species extinction, the directives for potential genome analysis, acknowledging that only some species have been characterized, and in addition justifies how socially compatible the gecko is compared with other reptiles.

Further insights recommend how the organism has medicinal and therapeutic benefits and can inspire the invention of bioadhesive technology through the setae, which contain keratin that confers the species with the rigidity to walk through any surface texture.

Abbrevation:
VEGF - vascular endothelial growth factor
bFGF- basic fibroblast growth factor
CTX - Cytoxan
EC9706 and EC1 - the growth rate of human esophageal carcinoma cells
M-AG - Macromolecular fractions of fresh gecko aqueous extract,
S-AG - small molecular components of gecko aqueous extracts
V-AG - Valley part of Gecko aqueous extracts
ERK1/2 - Extracellular Signal-Regulated Kinases ½

Declarations:
Ethics approval and consent to participate: Not applicable

Consent for publication: Not applicable

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Conceptualization and methodology:C.M.I., writing: C.M.I., E.T.A., and I.S.B., validation: C.M.I., E.T.A. and I.S.B; Statistical analysis: T.M.B., data curation:E.T.A., writing—original draft preparation: C.M.I., writing—review and editing: C.M.I., E.T.A., and I.S.B., visualization: C.M.I and T.M.B., project administration: C.M.I., E.T.A., and I.S.B. All authors have read and agreed to the published version of the manuscript.

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