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Traditional Ethnozoological Practices of Galliformes by Indigenous Inhabitants in Koraput District of Odisha, India

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Abstract Hunting has been a traditional human practice for centuries to exploit faunal resources for beneficial needs. Wild Galliformes are particularly hunted for bushmeat, ornaments, religious rituals, spiritual practices, and medicine. This study documents the traditional ethnozoological knowledge and practices of Galliformes utilized by the Indigenous inhabitants of Koraput district, Odisha, India. Information was collected using the Participatory Rural Appraisal (PRA) method through semi-structured interviews. We recorded eight Galliformes species utilized in 23 distinct ways. Six body parts (meat, skull, egg, feather, feet bone, and body oil) were used to treat 15 human ailments. Results indicated that oral application (52.1%) was the most effective mode of treatment, followed by topical application (47.8%). Among the reported species, feathers of *Gallus gallus* and *Gallus gallus domesticus* were most commonly used for treating ear-related complaints (Fidelity Level [FL] = 100%), while feathers of *Pavo cristatus* were least utilized, associated with predicting the birth of male children (FL = 6.7%). This study provides the first documentation of the ethnomedicinal use of three quail species (*Coturnix coturnix*, *Perdicula erythrorhyncha*, and *Perdicula asiatica*) in Odisha. This study also highlights three hunting techniques along with the cultural importance of the Galliformes and is the first quantitative ethnozoological analysis of Galliformes in the Koraput district, using FL percentage scores. Findings of this study emphasize the significance of Galliformes, linked with traditional ethnomedicine, hunting, and socio-cultural systems.

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Introduction

Ethnozoology is defined as the study of human-animal interactions, which provides valuable insights into traditional knowledge systems and cultural contexts. Among tribal communities, this knowledge forms the backbone of healing practices and customs because wherein fauna and their by-products are used to treat various diseases (Alves et al. 2018; Costa-Neto 1999). Animal-derived products have long been valued for their medicinal properties in treating various human ailments (Alves and Rosa 2005, 2007; Alves et al. 2018; Lev 2003; Cragg and Newman 2013; Yinegar et al. 2007). The World Health Organization (WHO) reports that 80% of the global population relies on flora- and fauna-based medicines for immediate healthcare needs (WHO 1993). *Ayurveda*—an ancient system of medicine deeply rooted in Indian culture—utilizes a wide range of plant- and animal-based ingredients to treat ailments. It has served as a cornerstone of traditional healthcare practices since ancient times, particularly in remote areas where modern medical facilities are lacking (Patwardhan 2005). Even today, approximately 15–20% of *ayurvedic* medicines are derived from animal sources

(Chaudhury et al. 2016; Kim and Song 2013). Therefore, animals have consistently been utilized in traditional medicine across various cultures (Haq et al. 2020; Loko et al. 2019; Singh et al. 2020; Souza et al. 2022).

India is home to a diverse array of tribal communities, each with its unique ethnomedicinal practices. These traditions vary across regions and reflect distinct cultural beliefs, as observed in Himachal Pradesh (Singh et al. 2020), Assam (Borah and Prasad 2017), Rajasthan (Kushwah et al. 2017; Mahawar and Jaroli 2006), Tamil Nadu (Chellappandian et al. 2014; Vijayakumar et al. 2015b), Ladakh (Haq et al. 2020), Kerala (Vijayakumar et al. 2015a), and West Bengal (Chaudhury et al. 2016). Odisha similarly stands out for its rich diversity of tribal communities, accounting for 9.7% of India's total tribal population, with 62 tribal communities comprising 22.1% of the state's overall population (Scheduled Castes and Scheduled Tribes Research and Training Institute 2018). Within this demography, ethnozoological practices form an integral part of cultural life and have been well documented in several regions of Odisha (Jena et al. 2020; Joseph 1988; Mishra and Panda 2011; Mishra et al. 2011; Pradhan 2016), highlighting the importance of animal resources in both traditional medicine and daily practices.

Hunting is one of the oldest human activities and remains an integral component of ethnozoological practices, reflecting the relationship between human societies and wildlife (Alves 2012). Faunal-derived products serve a range of purposes beyond medicine, including use as food, clothing, and in magico-religious practices (Alves et al. 2018). In India, hunting was an ancient practice and a vital survival tool for sustenance in various communities, and it continues today with complex ecological, social, and economic implications (Gubbi and Linkie 2012; Velho et al. 2012). While mammal hunting has been more extensively documented, the use of avifaunal resources for human needs is equally rooted in Indian culture (Aiyadurai 2011, 2012). The illegal hunting of scheduled wild birds through various hunting techniques remains a major concern, irrespective of their conservation status at present (IUCN 2024; Neto et al. 2022).

Galliformes, commonly known as gamebirds, have long been part of human lifestyles as domesticated pets. However, they are now greatly threatened due to excessive hunting pressures driven by the demand for their high-protein bushmeat, ornamental value, plumage, and use in ethnomedicines and religious practices (Aiyadurai 2011, 2012; Fuller and Garson 2000; Kaul et al. 2004; Singh et al. 2022; Tian et al. 2018). Hunting customs such as "small game hunting," targeting wild fowls in Western Odisha, have been documented by Padhan (2023), yet there remains a substantial knowledge gap regarding the utilization of Galliformes by tribal communities in Southern Odisha. A previous avian diversity study in the Koraput district by Majumdar (1988) made no mention of Galliformes or associated ethnozoological practices. Therefore, the present study aims to document the ethnozoological uses and hunting practices involving Galliformes among tribal inhabitants in the Koraput district through detailed quantitative analysis.

Methods

Study Area

The present study was conducted in the Koraput district of Odisha, located along the western fringe of the Eastern Ghats in the southern part of the state (18º 13' to 19º 10' N and 82º 5' to 83º 23' E), covering approximately 8,807 km^2. Geographically, the study area is covered with hilly terrain (highest peak, 1,672 m asl), dense forests, waterfalls, and narrow intermontane valleys. Koraput shares its borders with two neighboring states of India: Chhattisgarh to the west and Andhra Pradesh to the south (Figure 1).

The district is administratively divided into 14 blocks, comprising 226 Gram Panchayats and 2,042 villages. It has a total population of 1,379,647, and a population density of 157 people per square kilometer (Office of the Registrar General and Census Commissioner India 2011). Approximately 50% of this population belongs to tribal communities such as the *Paraja*, *Gadaba*, *Kandha*, *Saura*, and others (Behera and Mohanty 2019; Scheduled Castes and Scheduled Tribes Research and Training Institute 2018). These tribal groups, commonly referred to as *Adivasis*, depend mostly on natural resources for their livelihoods. India is home to 45 Galliformes species, of which 13 species—comprising five quails, two spurfowls, three francolins, and two pheasants—are present in Odisha and are currently categorized as Least Concern (LC) (Sathyakumar and Sivakumar 2007).

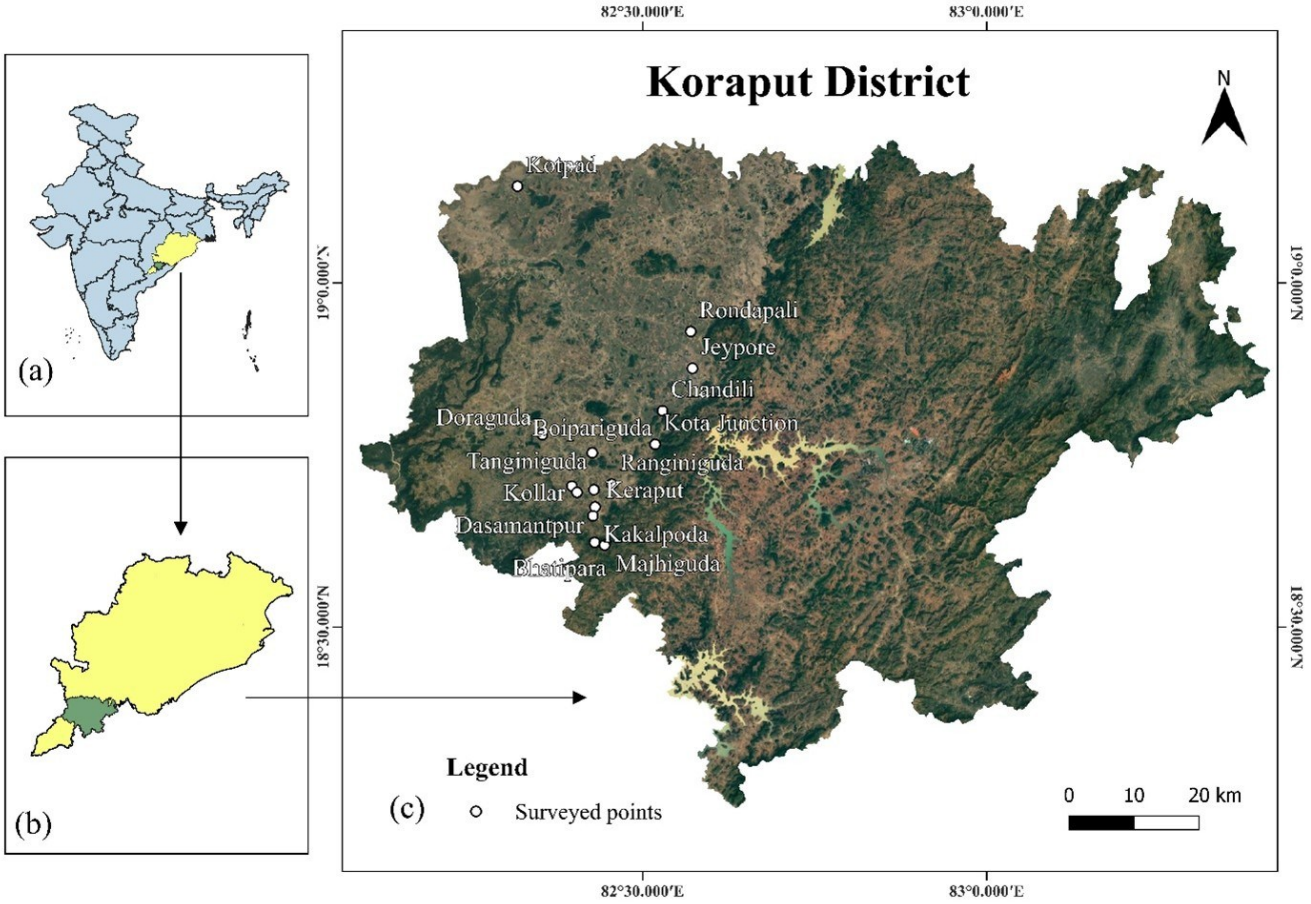

Figure 1 Sites and localities surveyed for the questionnaire in the Koraput District of Odisha.

Data Collection

Field surveys were conducted across 15 regions of the Koraput district, Odisha—Boipariguda, Doraguda, Tanginiguda, Kollar, Dasamantpur, Keraput, Kakalpoda, Majhiguda, Bhatipara, Ranginiguda, Kota Junction, Chandili, Jeypore, Rondapali, and Kotpad (Figure 1). Semi-structured interviews, based on the Participatory Rural Appraisal (PRA) method (Kim and Song 2013; Kumera et al. 2022), were conducted from March to May 2023, totaling 200 hours of data collection on ethnozoological practices of Galliformes. Both investigators and respondents were actively involved in discussions during the interview. We targeted participants from various age groups (Table 1). Prior to the interviews, we introduced ourselves to the locals, explained the study objectives, and requested permission while emphasizing our commitment to respecting and protecting their Intellectual Property Rights (IPR). The questionnaire was designed following Chellappandian et al. (2014), Huntington (2000), Kumera et al. (2022), Vijayakumar (2015a), and focused on documenting the Galliformes species involved in ethnozoological practices, their vernacular names, hunting methods, body part utilization, medicinal purposes, modes of application, and any associated commercial applications.

Quantitative Analyses

The respondents' answers were summarized and analyzed using Fidelity Level (FL). FL was calculated to identify the frequently used Galliformes species for treating certain ailments, as reported by the inhabitants in the study area. The FL percentage was calculated using the following formula:

$$FL\ (\%) = Np/N \times 100$$

Here, *Np* denotes the number of informants who mentioned the use of specific animal species for certain ailments, and *N* denotes the total number of informants who used a particular species for treating any ailment (Chellappandian et al. 2014; Kim and Song 2013; Kumera et al. 2022; Loko et al. 2019; Vijayakumar et al. 2015a). The higher values of FL

Table 1 Demographic profiles of respondents interviewed for the survey (n = 45).

Demographics		Number of Respondents	Percentage (%)
Gender	Male	33	73.33
	Female	12	26.67
Age Group	Between 18-30	5	11.11
	Between 31-40	6	13.33
	Between 41-50	20	44.44
	Between 51-60	9	20
	Above 60	5	11.11

percentage indicate greater agreement among respondents regarding the utilization of an animal species for treating ailments, while lower values reflect less agreement of respondents for using a particular animal species for treating any ailments.

Results

Demographic Characteristics of Respondents

Individuals (n=45) aged above 18 years (33 males and 12 females) participated in the interviews (Table 1). The majority of respondents (44.44%) were aged 41–50 years. Participants aged above 60 and 18–30 years were the least represented, each accounting for only 11.11%. Most respondents had poor literacy levels and belonged to the low-income groups. Male respondents accounted for 73.33%, whereas females comprised only 26.67%. In terms of daily activities, females were primarily engaged in household chores and agricultural activities, while males were predominantly involved in farming, cattle grazing, and coaching traditional practices and customs to the younger generation.

Galliformes Diversity and Habitat in the Study Area

The respondents identified eight Galliformes species (Table 2) that are commonly observed and locally recognized. Most of these species are known by their vernacular names; in the local *Desia* and *Odia* languages, fowls are commonly referred to as *Kukda*. Additionally, male fowls are called *Ganja*, whereas females are called *Peti*.

The study area, surrounded by dense forests, bamboo thickets, and terraced croplands, provides a diverse and suitable habitat for Galliformes. These birds primarily occupy areas that provide mix of forest cover and open spaces, ensuring both shelter and foraging grounds. Quails and spurfowls are particularly abundant in agricultural fields, like rice paddies, but particularly in finger millet farms, locally called *Mandia*. Unlike the more solitary pheasants, these species are in small groups, taking advantage of the resources provided by the agricultural landscape. This close association with agricultural areas highlights the role of human-altered landscapes in supporting certain Galliformes species.

Ethnomedicinal use of Galliformes

In the Koraput district, certain tribal communities rely on fauna-based medicine to treat a range of human ailments, relying mostly on Galliformes species (Table 2; Supplementary Table 1). Oral administration (52.1%) is slightly more prevalent than topical application (47.8%) among the documented practices. Six body parts of Galliformes—meat, skull, eggs, feathers, feet bones, and body oil—are commonly used in the preparation of medicinal remedies. *G. gallus domesticus* is favored over wild species due to its easy accessibility, particularly for treating ailments such as bone fractures, joint pain, musculoskeletal disorders, and analgesics. The meat of*C. coturnix*, *P. erythrorhyncha*, and *P. asiatica*is commonly used for treating kidney stones. Feathers of *P. cristatus*, *G. gallus*, and *G. gallus domesticus* are mostly used for ear complaints. Additionally, the feathers of *P. cristatus* are utilized to treat ailments such as constipation, diarrhea, fever, cough, and cold in children, as well as for exorcisms and spiritual practices.

Patterns of Fidelity Level

We found that the most quoted species, with all 45 respondents citing the use of *G. gallus* and *G. gallus domesticus* feathers for ear wax cleaning, achieved the highest FL value of 100% (n = 45). This was followed by the feathers of *P. cristatus* used for exorcism (n = 42, FL = 93.3%) and warding off the evil eye (n = 41, FL = 91.1%). The meat of *G. gallus* and *G. gallus domesticus* was used for treating fever, cough and joint pain (n = 40 each, FL= 88.9%), followed by *P. cristatus*

Table 2 Ethnomedicinal uses of Galliformes by the local inhabitants of Koraput District, Odisha.

SL No.	Scientific Name	English Name	Local Name/ Vernacular Name	Parts/Products Used	Ailments Treated	Additives Used	Preparation	Mode of Application	FL %
1	*Pavo cristatus*	Indian Peafowl	*majura, mayura, jalia majura (male), maku majura (female), mai majura (female)*	Meat	-	None	Eating after cooking	Oral	NA
				Skull- Head part	Evil attack	None	Praying	Topical	13.3
				Egg	-	None	Eating after cooking	Oral	NA
				Feather	Fever, Cough, Cold, Vomiting, Diarrhea, and Constipation in young ones	Mustard Oil	Feather-roasted, powdered, and dissolved in mustard oil to make tiny balls	Oral	20
					Exorcism	None	A bunch of eye tail feathers is stroked over the body	Topical	93.3
					Evil eye	None	Tying	Topical	91.1
					Pregnant women have an increased probability of having a boy	Banana	Eye tail feather in between the cut banana	Oral	6.7

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SL No.	Scientific Name	English Name	Local Name/ Vernacular Name	Parts/Products Used	Ailments Treated	Additives Used	Preparation	Mode of Application	FL %
					Ear complaints	Water	Feather burnt, crushed, and dissolved in	Topical	46.7
					Fever, Cough, Vomiting, Cold, and Febrile convulsions in young ones	None	The eye tail feather is tied with a string and worn on the neck	Topical	86.7
				Feet Bone	Ear infections like ear pus	Sandalwood rubbing stone or any grinding stone	Dried legs are ground on a grinding stone with water in a circular motion and put into the ear as drops	Topical	11.1
2	*Gallus gallus*	Red Junglefowl	*desi kukda, bana kukda, bana ganja (male), ganja kukda (male), mai kukda (female), peti kukda (female), bana*	Meat	Fever, Cough, Joint pain, Bone fractures	None	Eating after cooking	Oral	88.9

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SL No.	Scientific Name	English Name	Local Name/ Vernacular Name	Parts/Products Used	Ailments Treated	Additives Used	Preparation	Mode of Application	FL %
				Feather	Ear wax cleaning	Coconut Oil/ Mustard Oil	Dipped in oil, & used as an ear bud to clean	Topical	100
				Leg	Cough, Cold	Vegetables	Soup	Oral	57.8
				Egg	-	None	Eating after cooking	Oral	NA
3	*Gallus gallus domesticus*	Domestic chicken	*kukda, ganja Kukda (male), peti kukda (female)*	Meat	Fever, Cough, Joint pain, Bone fractures	None	Eating after cooking	Oral	88.9
				Feather	Ear wax cleaning	Coconut Oil/ Mustard Oil	Dipped in oil, & used as an ear bud to clean the earwax	Topical	100
				Leg	Cough, cold	Vegetables	Soup	Oral	66.7
				Egg white	Bone fracture	None	Massaging	Topical	84.4
4	*Galloperdix lunulata*	Painted Spurfowl	*pandka, mai titri (female), khoimo kukda*	Body Oil	Skin burns	None	Massaging	Topical	75.6
5	*Galloperdix spadicea*	Red Spurfowl	*khoimo kukda, khoimi kukda, patrali kukda, choto ban kukda*	Body oil	Body wounds, Skin burns, Body swelling	None	Massaging	Topical	75.6

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SL	Scientific Name	English Name	Local Name/	Parts/Products	Ailments	Additives	Preparation	Mode of	FL %
6	*Perdicula erythrorhyncha*	Painted Bush Quail	*ban gundri, bodo ban gundri, gagor gundri, bodo*	Meat	Kidney stones	None	Eating after cooking	Oral	86.7
7	*Perdicula asiatica*	Jungle Bush Quail	*sano gundri, kani gundri, duma gundri, choto gundri, manda gundri*	Meat	Kidney stones	None	Eating after cooking	Oral	86.7
8	*Coturnix coturnix*	Common Quail	*jommi gundri*	Meat	Kidney stones	None	Eating after cooking	Oral	86.7

feathers, which were used to manage febrile convulsions in children (n = 39, FL = 86.7%), and the egg white of *G. gallus domesticus*, which were used for healing bone fractures (n = 38, FL = 84.4%). The quail species, including *C. coturnix*, *P. erythrorhyncha*, and *P. asiatica*, all showed identical FL values of 86.7%, reflecting their effectiveness in treating kidney stones. Similarly, the *Galloperdix spadicea* Gmelin, JF, 1789 and *Galloperdix lunulate* Valenciennes, 1825 both exhibited identical FL values of 75.6%, with their body oil used to treat skin burns. Conversely, certain uses showed lower FL values. For instance, the skull of *P. cristatus* had a low value (n = 6, FL = 13.3%) for treating evil attacks, followed by the feet bones of *P. cristatus* used for ear infections (n = 5, FL = 11.1 %). The lowest FL value of 6.7% (n = 3) was observed for the oral consumption of *P. cristatus* feathers, believed to increase the likelihood of bearing a male child when used by pregnant women (Table 2).

Hunting Techniques

The reliance on wild meat in the Koraput district is closely tied to traditional hunting practices, which have been passed down through generations. According to the interviews, locals used a variety of weapons for hunting, including spears, bows and arrows, catapults, nets, bamboo traps, and ropes. The three main hunting techniques of Galliformes were net capturing, catapults, and bamboo basket traps (Figure 2). In the net capturing (Figure 2a), a long rope is attached to a triangle-shaped net with sharp iron nails along its edges. To capture wild Galliformes species, finger millet grains are scattered irregularly on the ground, and hunters hide nearby, holding the rope. When a fowl approaches and begins feeding, the trap is released, capturing the fowl. This technique is commonly used to capture *G. gallus*. In some cases, to capture a male wild *G. gallus*, a domesticated female fowl is tied near the trap. The male bird, drawn by the call of the female, is subsequently trapped by the hunters.

Catapulting, locally known as *Gulcha*, is one of the most widely practiced methods for hunting Galliformes (Figure 2b). This small, Y-shaped weapon is made of wood and rubber latex strips that acts as a sling for holding and launching stones. When a fowl is spotted or its call is heard, the hunter stretches the elastic strips to the desired tension and releases the stone, often striking the fowl from a considerable distance, resulting in its instant death.

Bamboo baskets (Figure 2c) are commonly used to trap quails and spurfowls, particularly for bushmeat. Flocks, locally referred to as *Manda*, frequently visit croplands, making them easy targets for hunters. In this method, finger millet grains are scattered, and bamboo baskets are propped slantwise using a short stick tied to a thin rope. When the fowls begin feeding, the rope is pulled, causing the basket to fall and trap the small fowls inside. These trapped fowls are then sold in local markets, with prices ranging from Rs. 70 to 400 per bird, depending on their size.

In the past, these trapping methods were widely employed to hunt Galliformes, which were abundant in the region. However, with the advent of modernization, changes in cultural practices, a lack of interest among young ones, and the implementation of stricter wildlife regulations, the frequency of hunting has significantly declined, leading to a reliance on domesticated fowls for meat, and thus reflecting a gradual move towards sustainable practices.

Galliformes in Sporting Cultures

Galliformes have historically held a significant place in rural sporting traditions (Fuller and Garson 2000). Among local communities, a traditional sport known as *Kukda gaali* (cockfighting) remains a part of the local sporting culture. Although cockfighting is prohibited under the Prevention of Cruelty to Animals Act, 1960, respondents indicated that it continues to be clandestinely practiced in certain areas of Koraput. This sport typically involves both wild *G. gallus* and domesticated *G. gallus domesticus*, which are pitted against each other in cockpit rings. The fights are often brutal, with sharp-edged spurs tied to the legs of the competing birds, forcing them to battle until one succumbs. These events are usually accompanied by gambling and serve as a major attraction during festivals or local gatherings, symbolizing rural entertainment.

Galliformes in Socio-cultural Practices

The tribal communities in Koraput celebrate an annual hunting festival known as *Chaitra Parab* or *Choith Porv*, which spans several days to a month. During this festival, it is customary for at least one male member from each family to participate with others. Experienced hunters venture into dense forests and return with game animals, which are subsequently offered to the local deities as a form of ritualistic thanksgiving and celebration. These

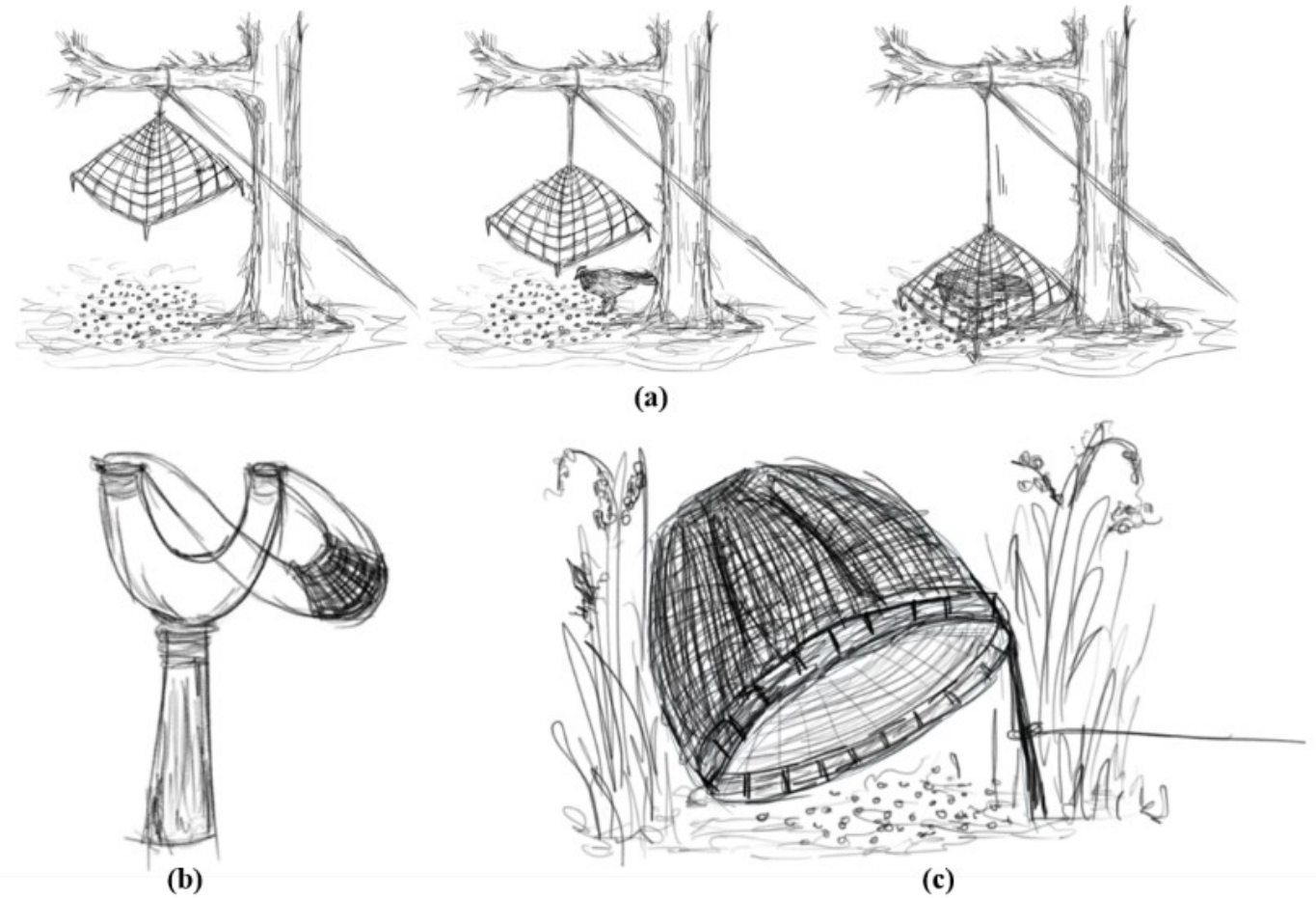

Figure 2 Different methods commonly used by locals to trap Galliformes in the Koraput district **A** Net capturing, **B** Catapult, and **C** Bamboo basket trap. Illustration by ©Bhawani Sabat.

offerings are made to invoke blessings and good fortune. *Saura paintings*, created by the Saura tribe, are made using natural pigments derived from white rice paste, charcoal, red earth, and plant extracts. Executed on the mud walls of homes, the artworks depict stylized human figures, animals, trees, sun, moon, and deities in intricate geometric patterns. During *Chaitra Parab*, the paintings often portray scenes of communal hunting, agricultural abundance, ritual offerings, and the harmonious relationship between humans and nature. During the survey, 88.9% of respondents were aware of the Indian Wildlife Protection Act (IWPA-1972) and the associated legal consequences of hunting or poaching of protected species. At present, many communities have transitioned from sacrificing wild animals to using domesticated fowls during the festival.

Galliformes' feathers are extensively used to create decorative items such as colorful fans for local rituals and festivals across the Koraput region. For instance, the modified tail contour feathers of *P. cristatus* are prominently featured in Koraput's traditional performances known as *Dhemsa* dance, where performers clad in vibrant costumes carry ornamental brooms adorned with the long iridescent eye feathers of peafowl. Additionally, both men and women embellish their turbans with colorful fowl feathers as a symbol of tribal identity and culture (Figure 3a). Participants reported that the majority of people participating in ritual activities purchase feathers from local markets rather than sourcing them through hunting (Figure 3b). Regarding the origin of these feathers, 60% of respondents believed the feathers were manually plucked, while the rest assumed they were naturally shed. Interestingly, the

Figure 3 Galliformes feathers in folklore and festivities **A** Use of colored Galliformes feathers on head crowns during folk dances at festivals **B** sale of *P. cristatus* feathers in local markets. Photo by ©Bhawani Sabat.

majority (64.44%) expressed indifference regarding the method of feather collection, prioritizing accessibility over origin.

Discussion

This study documented the ethnozoological practices and cultural significance of Galliformes in the Koraput district of Odisha. Firstly, we found that the knowledge and utilization of Galliformes were more prevalent among men, reflecting traditional gender-based roles in ethnozoological practices. Secondly, a key finding was the use of Galliformes body parts—both orally and topically—for treating various human ailments. These ethnozoological practices were supported by Fidelity Level (FL) analysis, which

highlighted commonly shared knowledge of ethnomedicines within the study area. Thirdly, we recorded the different types of hunting tools and techniques traditionally used to capture different Galliformes species. Lastly, we outlined the cultural and traditional importance of these birds, emphasizing their symbolic and ritual roles in people's lives.

This study faced several limitations. First, the sample size was relatively small and gender-biased, with fewer female respondents due to cultural restrictions, possibly limiting the full spectrum of medicinal and cultural knowledge known to women. Second, the study was geographically confined to a few locations in southern Odisha, which may not fully represent the diversity of ethnozoological practices across other Indigenous groups. However, our detailed, site-specific data offers valuable insights into regional practices that can serve as a foundation for broader comparative studies in the future. Third, we could not directly observe all hunting and cultural practices described due to their seasonal or private nature, however, we addressed this limitation using photo-elicitation and in-depth interviews to capture detailed narratives.

Despite these limitations, this study presents several strengths. To our knowledge, this is the first detailed documentation linking species-specific use of Galliformes in ethnomedicines and socio-cultural practices within a single narrative from the Koraput district of Odisha. We also documented the first ever meat usage of quail species (*C. coturnix*, *P. asiatica*, and *P. erythrorhyncha*) for treating kidney stones, which has not been previously reported, and emerged as a new finding highlighting a potentially undocumented aspect of local medicinal knowledge. The integration of field-based interviews with photographic documentation adds robustness to the findings. Furthermore, by emphasizing the inhabitants' sustainable interactions with local biodiversity, i.e. transitions from hunting to domestication—this study contributes a positive narrative to conservation discourse.

Oral consumption emerged as the most effective mode of treatment in the studied sites, which aligns with the findings of Vijayakumar et al. (2015a). Similarly, other studies documented the use of *P. cristatus*—including legs for ear ache and feathers for infertility and convulsions—corresponds with previous reports by Mishra et al. (2011), Vijayakumar et al. (2015a), and Chellapandian et al. (2014). Additionally, Chellapandian et al. (2014) also described the combined use of *P. cristatus* feathers with *Lepus nigricollis* to alleviate rheumatic pain and hemiplegia, highlighting their diverse medicinal role. Similarly, the use of *G. gallus* and *G. gallus domesticus*—feathers for removing earwax, meat and legs for joint pain, fever, cough, and cold, and eggs for bone fractures—has also been reported by Kumera et al. (2022), Altaf et al. (2018), Vijayakumar et al. (2015a), and Chellapandian et al. (2014). Beyond orthopedic treatments, *G. gallus domesticus* eggs have also been reported for treating cardiovascular diseases, convulsions, bronchitis, skin disorders, arthritis, and diarrhea (Chellapandian et al. 2014; Kim and Song 2013; Nayak et al. 2022; Vijayakumar et al. 2015a). In terms of burn treatment, Chhetri et al. (2020) reported that *G. gallus* fat is orally consumed for treating skin burns, whereas this study found that the body oil of *G. lunulata* and *G. spadicea* is predominantly used for similar purposes, indicating regional variations in species preference. While previous literature (Atlaf et al. 2018; Vijayakumar et al. 2015a, 2015b) has noted the medicinal use of *C. coturnix* for muscle pain, weakness, sexual health, and anemia, our study is the first to document the use of meat from *C. coturnix* for treating kidney stones, thus moving beyond earlier findings and contributing additional data to the ethnomedicinal knowledge of Indian Galliformes.

The findings of the study also align with existing literature on the cultural significance of Galliformes in India, particularly in relation to their integration into regional art, dance, and sporting traditions. The magico-religious use of *P. cristatus* feathers for exorcism and protection against evil spirits and prayer chanting has been previously documented among several tribal communities in the Mayurbhanj district of Odisha (Behera and Mohanty 2019) and Darjeeling (Chhetri et al. 2020). The species used for creating ceremonial feather fans vary by region—communities in Northeast India, for example, utilize feathers from *Lophophorus impejanus*, *Tragopan blythii*, *Polyplectron bicalcaratum*, and *Lophophorus sclateri*, indicating a widespread and culturally shared tradition (Aiyadurai 2011). While Bhat (2010) elaborates on the symbolic role of birds in "Indian Art Forms," our study adds by linking Galliformes to local paintings and traditional dance performances. A similar cultural expression involving birds has been reported among the Bhil tribe in Rajasthan (Kushwah et al. 2017). In sporting

traditions, the use of *G. gallus* and *G. gallus domesticus* in local recreation aligns with observations by Haq et al. (2020), who reported similar practices involving *Alectoris chukar* and *Tetraogallus* species in the Trans-Himalayas, again showcasing species preference according to various regions. These cultural continuities underline the multifaceted importance of Galliformes beyond medicinal use.

Importantly, the interactions of tribal communities in the study area with Galliformes provide a brief understanding of their existing Traditional Ecological Knowledge (TEK) about the birds' feeding habits and habitat requirements. Similar TEK has been noted in other ethno-ornithological studies (Pam et al. 2020; Tidemann and Gosler 2010). The interviewed farmers in the study area recognize quails and spurfowls as non-threatening, allowing them to forage on fallen millet grains, fostering a symbiotic relationship that benefits both agriculture and avifauna, fostering coexistence. This research contributes to the growing body of ethnozoological literature, emphasizing the role of TEK in future conservation efforts. Future research should expand to other regions for comparative analysis and further explore the transmission of ethnozoological knowledge across generations.

Conclusion

This study is the first to document the use of Galliformes in traditional medicine and culture in the Koraput district of Odisha, providing deep insights into the traditional ethnozoological knowledge of Indigenous inhabitants. These tribals are often referred to locally as "*Adivasis*," have an in-depth understanding of their local biodiversity, accumulated through generations of observation and oral knowledge transfer. The older generations serve as key knowledge holders in zootherapy, thus acting as living repositories of traditional animal-based medicine. Preserving such traditional ecological knowledge is important for their cultural identity and also for its potential to support modern conservation strategies. Despite increasing modernization through education, healthcare, and increased wildlife conservation awareness led by forest departments, has resulted in a gradual decline in reliance on Galliformes for food and medicine. This shift has reduced hunting pressures and fading traditional practices. However, traditional conservation practices include self-imposed rules such as seasonal taboos, selective hunting, and community norms against overharvesting, support certain species' persistence. Understanding the sustainability of such practices requires assessing factors like hunting pressure, habitat changes, economic pressures, and bird population trends. A key limitation of this study is the lack of quantitative ecological data, such as Galliformes population estimates or hunting pressure metrics, which would have helped assess the sustainability of traditional practices more robustly. In contrast, modern conservation approaches involve protected areas and legal protection. This study highlights the need to find common ground between these systems to ensure effective, community-led conservation of Galliformes species and support sustainability. Although the species documented in this study are categorized as Least Concern, they still matter. Awareness should be raised about the importance of Galliformes and the repercussions of species extinction among the local inhabitants. Future research should combine ecological monitoring with community engagement and expand ethnozoological studies across southern Odisha to safeguard both biodiversity and traditional knowledge systems.

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Declarations

Permissions: All interviewed individuals provided oral consent to participate in the study. They were informed about the primary objectives and importance of the research and were asked for prior permission to collect information. Participants were also made aware that their responses would be used for publication and scientific purposes, to which they agreed.

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