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Impact of Chinese Manja on avian population: Survey at Veeranari Chakali Ilamma University

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ABSTRACT

Background- The widespread use of synthetic, glass-coated "Chinese manjha" during kite-flying festivals such as Makar Sankranti poses significant risks to urban ecosystem. Its high tensile strength and sharpness contribute to severe injuries and mortality among avian species, animals, and humans, while also causing environmental hazards due to its non-biodegradable nature.

Objective- This study aimed to systematically assess the ecological and biological impact of Chinese manjha on avifauna, flora, and associated urban infrastructure within the Veeranari Chakali Ilamma University campus, Hyderabad, India.

Methods- A field-based survey methodology was used across multiple areas of the university campus. Systematic observations were conducted to document the presence of manjha on trees, buildings, and ground. Data was collected on the number of incidences of avian injury and mortality. Injured birds were recorded, categorized based on injury type, and rescue activities were performed.

Results- The survey revealed widespread distribution of Chinese manjha across vegetation, infrastructure, and open grounds. A total of 50 avian injury cases and 20 mortalities were documented during the study period, predominantly affecting pigeons and crows, with additional impacts on raptors and bats. Common injuries included lacerations, fractures, and severe tissue damage. Substantial plant entanglement and obstruction hazards to pedestrians were also observed.

Conclusion- Chinese manjha represents a critical anthropogenic threat to urban biodiversity and public safety. Promotion of biodegradable alternatives and strengthened regulatory laws is essential to reduce its impacts.

KEY WORDS

Chinese manjha; Avian population; Anthropogenic threats; Urban ecology; Laceration injury

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Introduction

Kite flying is a culturally significant activity widely practiced across India, particularly during festivals such as Makar Sankranti. Traditionally, kites were flown using biodegradable cotton threads. However, the increasing use of synthetic, glass-coated kite strings, commonly referred to as "Chinese manjha," has transformed this activity into a substantial environmental and public health concern [1]. Chinese manjha is composed of non-biodegradable nylon or synthetic fibers coated with materials such as powdered glass or metallic particles, increasing its tensile strength and cutting ability. Avian species are particularly vulnerable due to their aerial mobility, often encountering these threads during flight. Additionally, the presence of non-biodegradable manjha threads in the environment contributes to ecological degradation, including soil and water pollution [2].

Multiple studies and reports have documented its widespread impact. Epidemiological data indicate a sharp increase in avian injuries during kite-flying festivals. Species mostly affected include pigeons (Columba livia), crows (Corvus splendens), parakeets (Psittacula spp.), and raptors such as eagles. Reports suggest that raptors account for a high number of severe injuries due to their flight altitude and hunting behaviour. Mortality rates among injured birds have been estimated to range between 20-40%, depending on the severity of injury and availability of rescue operations [3] (Table 1).

Table 1. Year-wise Reported Avian Injuries and Mortality due to Chinese Manjha in India.

Year	Estimated Avian Injuries	Estimated Avian Deaths	Mortality Rate (%)
2017	1500–2000	300-500	20-25
2018	1800-2500	400-700	22-28
2019	2000-3000	500-900	25-30
2020	1200-1800	250-500	20-27
2021	1500-2200	300-600	22-28
2022	2200-3500	500-1000	23-30
2023	3000-4000	700-1200	25-32
2024	3500-4500	800-1500	26-33
2025	4000-5000	900-1800	28-36

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Human injuries are also recorded including deep lacerations, tendon injuries, and fatal cervical cuts among motorcyclists. In urban areas, emergency department reported a 10-15% increase in trauma cases linked to kite strings during peak festival days. Environmental impact is also concerning where manjha present for extended periods, leads to accumulation on trees, buildings, and power lines. It has been associated with electrical disruptions, including short circuits [4] (Table 2).

Table 2. Year-wise human injuries and fatalities due to Chinese Manja in India.

Year	Estimated Human Injuries	Estimated Fatalities
2017	80-100	02-Apr
2018	100-120	03-May
2019	120-150	04-Jun
2020	70-90	02-Mar
2021	90-110	03-Apr
2022	120-160	04-Jul
2023	150-200	05-Aug
2024	180-250	06-Oct
2025	200-300	07-Dec

Urban green spaces, such as institutional campuses, function as important microhabitats that support diverse avian populations, including both resident and migratory species. However, during kite-flying festival, these ecosystems become hazard zones due to the usage of kite strings. Detached and abandoned strings settle on tree canopies, shrubs, and built structures, and birds using these habitats for roosting, nesting, and foraging are at increased risk of injury [5]. The present study focuses on Veeranari Chakali Ilamma University, a 42-acre urban campus characterized by dense vegetation and diverse fauna. Due to its ecological structure and location within a metropolitan setting, the campus is suitable for studying the impacts of kite-related activities. Even with increasing reports of kite string-related injuries, there is limited site-specific evidence documenting their impact within defined urban ecosystems. Therefore, a systematic survey was conducted within the university campus to evaluate the distribution of kite strings and their effects on avian species and vegetation. Data collection included counting of entangled kites, plant damage assessment, and documentation of avian injury and mortality. Injured animals are often categorized based on the type and severity of injuries, followed by rescue, rehabilitation, and release.

Existing literature demonstrates a strong association between the use of Chinese manjha and increased rates of avian injury and mortality. Injury profiles commonly include deep lacerations, tendon damage, fractures, and extensive tissue loss. Observational studies reported most injuries occur in wing regions, affecting flight capability and survival. Temporal analyses indicate that injury incidence peaks during festival periods. Rescue data further reveal that a large proportion of affected birds die to injuries due to delayed detection or limited access to veterinary care [6].

Published studies are based on hospital case reports, rescue databases, and short-term festival observations, resulting in lack of ecological data. Also, most research relies on secondary rescue data rather than direct field-based surveys, thus limiting the understanding of real-time impact. The present study performs a systematic, ground-level survey within a defined university ecosystem, supporting direct observation of manjha distribution, avian injuries, and vegetation impact. This study will provide a primary ecological data, thus improving the understanding of site-specific anthropogenic threats in urban environments [7].

Materials and Methods

The present study was conducted within the campus of Veeranari Chakali Ilamma University. The campus consists of dense vegetation, including trees, shrubs, and green spaces, supporting a diverse population of avian species such as pigeons, crows, parakeets, owls, and raptors. Its location within a metropolitan setting, combined with relatively reduced anthropogenic disturbance compared to surrounding areas, makes it a suitable microhabitat for assessing localized ecological impacts.

The survey used a field-based, cross-sectional study to evaluate the environmental distribution and biological impact of Chinese manjha during the kite-flying festival period. The campus was divided into multiple zones, including academic buildings, open grounds, tree-dense regions, pedestrian pathways, and peripheral areas. This approach enabled massive coverage and helped the assessment of distribution patterns across the ecological and structural locations. Surveyors performed transect walks to document the presence and accumulation of Chinese manjha on different regions (Figure 1). The following parameters were recorded:

- Entanglement of kite strings on buildings, electric wires, and infrastructure
- Accumulation of cut or discarded manjha on ground surfaces
- Number of kites and strings entangled within vegetation

Figure 1. Different zones of the campus which were surveyed to observe kites and Chinese manjha over trees, buildings and cable wires.

Vegetation within the study area was examined for physical damage associated with manjha entanglement. These observations were documented to evaluate the impact of

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Chinese manjha on vegetation within the campus. Avian population within the campus was monitored during the survey period to identify injury and mortality events associated with Chinese manjha. Data collection involved:

- Number of injured and deceased birds
- Identification of affected species
- Documentation of type and severity of injuries

Injured birds identified during the survey were rescued and basic first-aid measures were performed, followed by veterinary care visit where required. Birds that recovered were rehabilitated and released back into their natural habitat within the campus.

All observations were recorded manually during field surveys and compiled into datasets. The data was analysed using descriptive statistical methods, including frequency counts and proportional assessment of injury types and affected species. No advanced inferential statistical analysis was performed, as the study primarily aimed to generate observational and descriptive evidence of localized ecological impact.

Ecological significance of the campus observations

The university campus represents a defined urban green space in which wildlife, vegetation, buildings, and human activity occur in proximity. The observations from this setting illustrate how a culturally associated recreational activity can introduce a persistent synthetic material into an urban habitat. The concentration of manjha in tree-rich areas and open grounds, together with the occurrence of injured birds across several species, indicates that exposure is influenced by both habitats use and the physical distribution of discarded strings. Although the present survey is descriptive and site-specific, the findings provide a useful baseline for future monitoring. Repeated surveys before and after festival periods could help determine whether accumulation is seasonal, whether locations consistently act as risk hotspots, and whether removal and awareness measures reduce subsequent injury events.

Rescue response and immediate intervention

Rescue observations provided an additional practical perspective on the consequences of manjha exposure. Birds found suspended from branches or wires required careful removal of the string before they could be assessed. Immediate assistance was provided to injured individuals, followed by veterinary care when required. Recovered birds were rehabilitated and released into their habitat where appropriate. These observations suggest that early detection may influence the outcome of entanglement events. Birds that remain trapped for longer periods may experience worsening tissue injury and reduced ability to obtain food or escape from predators. Regular post-festival inspection of vegetation and structures could therefore complement rescue activities by identifying trapped animals before injuries become irreversible.

Vegetation and infrastructure as secondary risk sites

The survey also demonstrates that the ecological impact of manjha extends beyond individual bird injuries. Trees and shrubs can retain synthetic strings within their branches and shoots, effectively converting vegetation into persistent trapping sites. Such accumulation may be difficult to identify from ground level when strings become mixed with foliage. Buildings, wires, and other structures can similarly retain kite material and may act as points from which loose strings extend into areas used by birds or pedestrians.

The presence of discarded material on pathways and open grounds indicates that the environmental burden is also relevant to human movement and campus maintenance. Thus, the problem should be considered as a combined wildlife, vegetation, infrastructure, and public-safety issue rather than only an avian injury problem.

Pattern of avian exposure and injury

The documented cases show that interaction with manjha can occur through both direct contact and entanglement. Birds moving through vegetation or flying between structures may come into contact with suspended strings, while individuals using trees for resting can become trapped in accumulated material. The injury records from the campus included deep lacerations, muscle and tendon damage, fractures around the elbow region, leg injuries, and extensive tissue damage. Wing-related injuries are particularly consequential because impairment of the wing or associated musculoskeletal structures can reduce flight ability and make feeding, escape, and normal movement difficult. The occurrence of fatal injuries, including decapitation and extensive tissue damage, further demonstrates that the hazard can be severe when birds remain entangled for prolonged periods.

Environmental distribution and exposure pathways

The field observations indicate that Chinese manjha within the university campus was not restricted to a single environmental compartment. Strings were detected on tree branches, plant shoots, buildings, electric wires, open ground, and along pedestrian pathways. This distribution creates several possible exposure pathways for birds and other organisms. Vegetation provides roosting, nesting, and foraging sites, while buildings, wires, and open grounds are frequently used as movement or landing areas. Once a kite string becomes detached from a kite, it can remain in these locations and continue to represent a hazard beyond the period of active kite flying. The repeated accumulation observed on some trees suggests that removal of visible strings immediately after the festival period may be necessary to reduce continuing exposure.

Results

Chinese manjha and entangled kites were observed across all survey zones of the campus. High frequency of kite entanglement was recorded in tree-dense regions, where multiple kites and strings were found lodged within branches. Several trees showed repeated accumulation of manjha, indicating continuous deposition. Cut and discarded manjha was observed on ground surfaces, particularly along pedestrian pathways and open areas. These strings often formed loose coils or extended strands, posing potential hazards to movement within the campus (Figure 2).

Data indicated that vegetation across the campus was substantially affected by the Chinese manjha. Numerous plants and shrubs were found with strings entangled around their shoots and branches, resulting in physical obstruction and mechanical stress.

A total of 50 avian injury cases and 20 mortality cases were documented during the survey period, following the Makar Sankranti festival of January 2025. The affected species included pigeons (Columba livia) and crows (Corvus splendens), with cases involving owls, eagles, hornbills,

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parakeets, and bats.The injury patterns observed was consistent across species, with the majority involving the wings and associated musculoskeletal structures (Figure 3). Common injury types included:

- Deep lacerations of the wing membranes
- Muscle and tendon damage
- Fractures at the elbow joint
- Leg injuries and entanglement-related trauma

Figure 2. Manja on the ground and entangled on plant shoots

Figure 3. Birds and bat injured by Chinese manja in the campus.

Fatal injuries such as decapitation and extensive tissue damage were recorded, with affected birds found dead on the ground. The mortality ratio indicates a high severity of injury associated with Chinese manjha. Also, multiple cases of avian entanglement were recorded, where birds were found suspended from tree branches or wires due to their limbs being trapped in manjha.

During the process, several injured birds were rescued and provided immediate assistance. A large eagle was observed hanging from a tree with its foot entangled in manjha. Other species, including crows and owls, were similarly found trapped and were freed from the strings. While several rescued birds recovered and were released back into their habitat, some died due to their injuries (Figure 4).

Figure 4. Rescuing of birds effected with Chinese manjha at the campus.

Analysis of the zones indicated that tree-rich areas and open grounds experienced the highest levels of manjha accumulation and avian injuries. These zones function as landing sites for kites and habitat hotspots for birds, thereby increasing the probability of interaction between wildlife and hazardous materials. The uniform distribution of manjha across different zones of the campus suggests that the impact is not localized but rather systemic within the urban ecosystem.

The survey demonstrated that Chinese manjha is widely distributed across the campus environment and is associated with significant avian injury and mortality, as well as measurable impact on vegetation and human safety. The recorded data define the severity of this anthropogenic threat within a confined urban ecosystem.

Discussion

The findings of the survey demonstrate a substantial ecological burden associated with the use of Chinese manjha within an urban institutional ecosystem. The documentation of 50 avian injuries and 20 mortality cases within a confined campus during a single festival period defines the intensity of this anthropogenic threat. These observations are consistent with previously reported data from urban centres across India, where kite-flying festivals are associated with a marked increase in wildlife injuries and fatalities [8]. While earlier studies have highlighted a higher vulnerability among raptors due to their hunting behaviour the reported injuries among pigeons and crows in the present study reflects their greater abundance within the campus ecosystem and increased exposure to anthropogenic environments. A major contribution of the study is the field-based survey, which provides observational evidence of the environmental distribution of manjha [9]. Compared to other studies that depend on rescue centre or hospital-based data this survey highlights the widespread accumulation of manjha across vegetation, infrastructure, and ground surfaces. Such findings support published environmental reports indicating that synthetic manjha, being non-biodegradable, continues to pose risks after the festival period [10].

The entanglement of manjha within tree canopies and plant structures observed in this study further proves its role as an environmental hazard.

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Vegetation not only serves as a primary site for string accumulation but also acts as a secondary trapping mechanism for birds, increasing the chances of delayed injury and mortality. Similar findings have been reported in previous studies, where trees function as focal points for both exposure and entanglement. The findings demonstrate that even within a limited geographical area, the magnitude of injury and environmental contamination can be considerable, reinforcing the need for site-specific monitoring and intervention strategies [11].

Despite regulatory measures, including the nationwide ban on synthetic manjha, its continued presence within the study area reflects gaps in enforcement and public compliance, as noted in policy and environmental reports. This suggests that legislative action alone is insufficient and must be accompanied by public awareness initiatives, community engagement, and promotion of safe alternatives [12].

Conclusion

The present study provides a focused evaluation of the ecological impact of Chinese manjha within the campus of Veeranari Chakali Ilamma University, presenting its role as an anthropogenic hazard in urban ecosystem. The survey revealed widespread distribution of synthetic kite strings cross vegetation, infrastructure, and ground surfaces, indicating their presence after the kite-flying period and their potential to cause environmental disturbance. This study supported existing evidence that Chinese manjha poses an ecological threat, particularly during festival periods, and demonstrates that even localized environments can experience substantial biological impact. By adopting a systematic survey-based approach, the study contributed the observational data that contradicts existing literature, which is often limited to rescue or clinical records. The study explained the importance of site-specific assessments in understanding the dynamics of anthropogenic disturbances within urban green spaces.

Future research should prioritize the establishment of longitudinal monitoring systems to evaluate the persistence and cumulative effects of synthetic kite strings. Integration of data from field surveys, wildlife rescue centres, and veterinary records would improve the accuracy and comparability of reported outcomes. Further investigations into species-specific vulnerability, behavioural responses, and reproductive impacts are required to better understand ecological consequences. Additionally, the development and evaluation of biodegradable alternatives to synthetic manjha remain essential for reducing environmental risk. Also, the findings highlight the need for strengthened regulatory enforcement and increased public awareness to reduce the effects of Chinese manjha and promote safer practices within urban ecosystems.

Disclosure Statement

No potential conflict of interest was reported by the author.

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