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Barbed Wire Fence as a Threat to the Indian Giant Flying Squirrel in Udhagamandalam, The Nilgiris, Tamil Nadu, India

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Abstract

This study reports an incident involving the Indian Giant Flying Squirrel (*Petaurista philippensis*) fatally trapped in barbed wire fencing, emphasizing the dangers posed by such human-made structures to arboreal wildlife. Additionally, the study highlights observations of this species at mid elevations in Ooty, shedding light on its ecological preferences and distribution. The findings underscore the need for wildlife-friendly fencing alternatives and conservation measures to mitigate threats in biodiversity-rich regions like Udhagamandalam.

Key words: Arboreal mammals, Barbed wire threats, Mid elevation, Sciuridae.

Resumen

Este estudio reporta un incidente que involucró una ardilla voladora gigante de la India (*Petaurista philippensis*) que quedó atrapada en una cerca de puas y murio, priorizando los peligros de estas estructuras humanas a la fauna arbórea. Adicionalmente este estudio resalta las observaciones de esta especie en elevaciones medias en Ooty, dando información sobre historia natural y distribución. Nuestros resultados resaltan la necesidad de cercados amigables con la fauna silvestre y medidas de conservación para mitigar estas amenazas en regiones con alta biodiversidad como Udhagamandalam,

Palabras Clave: Mamíferos arbóricolas, Amenazas de cerca de puas, Elevación Media, Sciuridae.

The Indian Giant Flying Squirrel (*Petaurista philippensis*) is a solitary, nocturnal, and arboreal rodent widely distributed across South and Southeast Asia, including India, China, and neighboring countries (Walston et al. 2016). It primarily inhabits dry deciduous and evergreen forests, typically at elevations between 500 and 2.000 meters, with occasional occurrences in plantation areas (Walston et al. 2016). Of the 44 known species of flying squirrels globally (Thorington & Hoffmann 2005), India supports 14 species, with the highest diversity in the Himalayan and northeastern regions (Sharma *et al.* 2013). In the Western Ghats, a recognized biodiversity hotspot, only two species are found: *P. philippensis* and *Petinomys fuscocapillus* (Samson et al. 2014). Despite its wide but fragmented distribution in India, including records from the Western Ghats (Nandini 2001; Samson *et al.* 2014), central India (Sharma 2007; Koli *et al.* 2013b), and the northeastern states (Ashraf et al. 1993) *P. philippensis* faces several threats. Although listed as "Least Concern" by the IUCN (Walston *et al.* 2016), regional populations are under pressure from hunting (Nandini 2000), habitat fragmentation (Kumara & Singh 2006), and increasing anthropogenic disturbances (Samson et al. 2023). An underreported but growing threat to this arboreal species is mortality caused by barbed wire fencing, which is increasingly used in human-modified landscapes. Here, we document a fatal entanglement of *P. philippensis* in such fencing in the Upper Nilgiris region of Tamil Nadu representing the first known record of this species at an elevation of 2.350 meters and highlighting a critical conservation concern.

Figure 1. *Petaurista philippensis* caught in the barbed wire to death.

On April 25, 2023, a carcass of *P. philippensis* was discovered entangled in barbed wire fencing along the roadside near private property (Figure. 1), at coordinates 11.4180, 76.6989. The left forelimb of the animal was caught in the wire, suspending the body, with visible abdominal injuries likely caused by the sharp edges. The carcass was in a transitional state between the fresh and bloating stages, suggesting death occurred 2–3 days earlier. The site was vegetated with invasive shrubs and tree species, including *Eucalyptus* spp., *Grevillea robusta*, *Acacia* spp., and *Pinus* spp., with *Passiflora tarminiana* growing on the eucalyptus trees. The boundary of the private property was enclosed with barbed wire fencing reaching 4–5 meters in height, some sections of which were topped with broken glass shards (Figure 2).

Figure 2. Walls lined with broken glass shards (left) and Barbed wire fencing (right) found near that area.

To the best of our knowledge, this is the first documented record of this species at such an elevation. Two additional observations of *P. philippensis* in the Nilgiris have been reported from Coonoor (1.780 m) and Kotagiri (1.680 m), both situated at comparatively lower elevations (GBIF 2023). A previous report of *P. philippensis* as roadkill was documented by Samson et al. 2014 along the Coonoor to Mettupalayam Highway. Such incidents have also been documented on the Conservation India portal, specifically in Agumbe, located in the Shimoga district of the Western Ghats, Karnataka. The barbed wire fences in the region were installed to safeguard the forest by preventing trespassing and grazing (Shreeram 2013) in which *P. philippensis* got entangled to death. A similar incident has been reported again in June 2014, highlighting the ongoing challenges of wildlife encountering these barriers in the area. Similar incidents have been reported involving other species of flying squirrels. The Northern Flying Squirrel *Glaucomys sabrinus* (Shaw 1801), one of three species in the genus *Glaucomys* and the only flying squirrels found in North America, was observed hanging on a fence (Nero 1992). Robert W. Nero also documented a similar occurrence in June 1944, as described in his book *Flying Squirrels: Gliders in the Dark*.

Barbed wire fencing, while effective for demarcating property and preventing livestock movement, poses a significant hazard to arboreal species attempting to glide or climb across fragmented landscapes. To mitigate these risks, wildlife-friendly alternative

solutions such as smooth wire fencing (van der Ree 1990; Booth 2006), Wrapping old polypipe around the top strand of barbed wire fence (Booth 2006; Land for Wildlife Queensland 2011), use of shiny or reflective metal objects to make the barbed wire more visible (Amesbury 2007; Land for Wildlife Queensland 2011), natural barriers (e.g., thorny hedgerows or bamboo), and low-voltage electric fencing can be implemented. These wildlife-friendly options not only minimize risks to animals but also preserve the effectiveness of boundary enclosures.

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