

Rhisotope Project: Using Radioactive Isotope Injections to Combat Rhino Poaching in South Africa

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Radioactive Isotope Rhino Poaching Latest News

- A South African university has launched the **Rhisotope Project**, an anti-poaching initiative that injects **radioactive isotopes into rhino horns** to deter illegal trafficking.
- The method, developed over six years by the **University of the Witwatersrand** with support from the **IAEA**, is safe for rhinos and enables customs officials to detect trafficked horns.
- The project began with **five rhinos treated in the Waterberg Biosphere Reserve** and aims to scale up for mass treatment to protect South Africa's declining rhino population.

Waterberg Biosphere Reserve

- The Waterberg Biosphere Reserve is located in the Bushveld district of Limpopo Province, South Africa.
- It functions as a water reservoir for this arid region.
- It comprises low mountain ranges, escarpments, and sparse soils with limited economic activity.

Ecological Characteristics

- The Waterberg Mountain Range is one of three major mountain ranges in the Limpopo Province.
- There are four main drainage rivers within the area: **the Lephalala, Mokolo, Matlabas and the Mogalakwena**.
- It represents a significant portion of Southern Africa's savannah biome.
- It features seven distinct vegetation types, including Central Sandy Bushveld and Waterberg Mountain Bushveld.
- The reserve is home to numerous threatened species, including the critically endangered black rhinoceros.
- It also includes the Nylsvley Nature Reserve, a registered Ramsar wetland site.
- It contains some of South Africa's most significant San rock art sites.

Radioactive Isotopes: Overview and Uses

- Radioactive isotopes, or radioisotopes, are unstable forms of elements that emit radiation as they decay into more stable forms.
- They can occur naturally (e.g., Uranium-238, Carbon-14) or be artificially produced in reactors or accelerators (e.g., Cobalt-60, Iodine-131).

Examples of Radioactive Isotopes

- **Carbon-14**: Used in radiocarbon dating of ancient organic materials.
- **Iodine-131**: Used in diagnosing and treating thyroid disorders.
- **Cobalt-60**: Applied in sterilising medical equipment and cancer radiotherapy.
- **Technetium-99m**: Widely used in medical imaging (nuclear scans).
- **Uranium-235 & Plutonium-239**: Fuel for nuclear reactors and weapons.

Uses of Radioactive Isotopes

- **Medical Applications**: Cancer treatment (radiotherapy); Diagnostic imaging (PET, SPECT scans)
- **Industrial Applications**: Non-destructive testing (X-ray of welds, pipelines); Sterilisation of medical equipment.
- **Agriculture**: Tracing nutrient uptake in plants; Pest control through irradiation.
- **Scientific Research**: Radiocarbon dating for archaeology; Tracer studies in biological and chemical research.
- **Anti-Poaching & Security**: Tagging wildlife parts (e.g., rhino horns in the Rhisotope Project) for tracking and detection at borders.

Radioactive Isotope Tagging Aims to Deter Rhino Poaching

- The Rhisotope Project uses low-dose radioactive isotopes to tag rhino horns, making them detectable by **radiation portal monitors (RPMs)** at global border points, thereby deterring illegal trafficking.

- Developed by the University of the Witwatersrand with IAEA support, the method is non-invasive and harmless to rhinos, while rendering the horns “useless” and “poisonous” to humans.
- Tests using 3D-printed rhino horns confirmed that tagged horns could be detected even inside 40-foot shipping containers.
- A pilot phase in June injected isotopes into 20 rhinos, with cytological examinations by Ghent University finding no cellular damage.
- This innovation is considered as a potential game-changer in combating the rhino poaching crisis.

The Poaching Crisis

- The global rhino population has plummeted from 500,000 in the early 20th century to just 27,000 today, largely due to rampant poaching driven by demand for rhino horns in Asian traditional medicine and status symbols.
- **South Africa, home to the largest rhino population**, has lost over 10,000 rhinos in the past decade, with 103 poaching cases reported in early 2025 alone.
- While the Rhisotope Project is not a definitive solution, researchers believe it could serve as a strong deterrent without disrupting rhino behaviour, unlike dehorning, which, though effective in reducing poaching, negatively affects rhino socialisation and territory ranges.
- The project’s success could pave the way for similar strategies to protect other endangered species like elephants and pangolins.

Source: IE | UNESCO

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