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Review Article

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Tree Beekeeping - Beekeeping in A Forest Environment From A Tree-Beekeeper's Perspective Andrzej Pazura

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ABSTRACT

Background/Purpose: Honeybees have been associated with forest environments for centuries, where old trees provided safe nesting sites, and a variety of plants and trees ensured a steady food supply. Human intervention disrupted this balance by relocating bees to agricultural landscapes. In Poland, the method of breeding bees in trees has a history spanning millennia, but it has not been practiced for over a hundred years. Tree beekeeping returned to Polish forests in 2007 through the initiative of people, who learned this unique craft from beekeepers in the Urals, whose families have been breeding bees in tree beehives for at least seven generations.

Problem Description: Tree beekeeping reestablishes a symbiotic relationship between honeybees and forest ecosystems by enabling bees to nest in healthy, living trees. Unlike agricultural apiaries, tree hives mimic the natural cavities found in old trees, offering optimal conditions for bee colonies to thrive. This practice also promotes the regeneration of melliferous plants and supports the conservation of bee-related fauna, which is critical for maintaining forest biodiversity.

Methodology: A man-made tree beehive serves as an equivalent to a natural cavity in an old tree, fulfilling the essential needs of a bee colony. Our collected knowledge equips us to construct tree beehives in suitable trees, spaced appropriately in areas with good sunlight and protection from adverse weather conditions. Traditional hand tools are used in the construction process to shape the hive's interior for safe handling. Once the tree beehive has been constructed and occupied by bees, maintenance occurs during two key periods: autumn and spring. The autumn inspection, sometimes combined with honey harvesting, is conducted after the flowering season and involves checking honey reserves while securing the beehive for winter. Spring inspection takes place as plants begin to bloom, focusing on cleaning out dead bees from the hive's bottom and preparing the beehive for a new swarm in the event of colony loss.

Results and Conclusion: The reintroduction of tree beekeeping in Polish forests has demonstrated significant ecological and cultural benefits including (a) the reestablishment of bees in their natural environment, contributing to forest pollination and biodiversity; (b) creation of bee-related fauna and biodiversity hotspots; (c) socio-cultural knowledge passed down through generations fosters environmental stewardship and reconnects communities with their cultural heritage.

Practical Implications for Beekeepers: Tree beekeeping is more than a method of honey production; it is a practice that deepens our understanding of bees in their natural habitat. Beekeepers gain firsthand insight into bee behavior and ecology, while the traditional skills required for hive construction and maintenance enhance their connection to nature. By integrating this ancient practice into modern forestry and conservation efforts, tree beekeeping offers an innovative and sustainable approach to safeguarding pollinators and enriching forest ecosystems. This initiative underscores the importance of blending socioecological knowledge with contemporary environmental strategies, ensuring that both bees and their habitats thrive.

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Introduction

Honeybees have been associated with forest environments for centuries, where old trees provided safe nesting sites, and a variety of plants and trees ensured a steady food supply. Human intervention disrupted this balance by relocating bees to agricultural landscapes. In Poland, the method of breeding bees in trees has a history spanning millennia, but it has not been practiced for over a hundred years. Tree beekeeping returned to Polish forests in 2007 through the initiative of people, who learned this unique craft from beekeepers in the Urals, whose families have been breeding bees in tree beehives for at least seven generations. Tree beekeeping reestablishes a symbiotic relationship between honeybees and forest ecosystems by enabling bees to nest in healthy, living trees. Unlike agricultural apiaries, tree hives mimic the natural cavities found in old trees, offering optimal conditions for bee colonies to thrive. This practice also promotes the regeneration of melliferous plants and supports the conservation of bee-related fauna, which is critical for maintaining forest biodiversity.

A man-made tree beehive serves as an equivalent to a natural cavity in an old tree, fulfilling the essential needs of a bee colony. Our collected knowledge equips us to construct tree beehives in suitable trees, spaced appropriately in areas with good sunlight and protection from adverse weather conditions. Traditional hand tools are used in the construction process to shape the hive's interior for safe handling. Once the tree beehive has been constructed and occupied by bees, maintenance occurs during two key periods: autumn and spring. The autumn inspection, sometimes combined with honey harvesting, is conducted after the flowering season and involves checking honey reserves while securing the beehive for winter. Spring inspection takes place as plants begin to bloom, focusing on cleaning out dead bees from the hive's bottom and preparing the beehive for a new swarm in the event of colony loss.

Platform for building tree-beehives. A structure assembled for the duration of creating the chamber for the bee colony. It ensures safety when working at heights of 4-6 meters and facilitates the proper construction and securing of tree-beehives.

The bee exit point from the tree hive. It prevents access by intruders and ensures fresh air circulation throughout the year. The wooden peg serves an additional function inside the tree-beehive, protecting the honeycombs and brood from breaking off.

Tree-beekeeping workshops – a form of practical learning for building tree hives and tree-beehive logs.

Log hive mounted in young forests where old and thick trees are lacking. The interior is made exactly like in a tree-beehive, but in a thinner piece of wood. It must be equipped with a roof and securely attached to another tree.

"Śniot", a board used to protect the tree-beehive during winter and against pests. Between the board and the wood there is an insulation made of small twigs and grass.

Queen cells in the nest of wild bees, indicating the natural reproduction process of the bee colony. By opening the tree-beehive during the autumn inspection, we can determine whether the bees swarmed this year.

The reintroduction of tree beekeeping in Polish forests has demonstrated significant ecological and cultural benefits including (a) the reestablishment of bees in their natural environment, contributing to forest pollination and biodiversity; (b) creation of bee related fauna and biodiversity hotspots; (c) socio cultural knowledge passed down through generations fosters environmental stewardship and reconnects communities with their cultural heritage.

Methods of entering bees in tree-beehives. On the left, leziwo; on the right, kiram. Leziwo – two flexible ropes used to make loops around the tree, allowing the beekeeper to climb into the tree hive; Kiram – a wide, rigid rope that wraps around the tree and the person

Tree beekeeping is more than a method of honey production; it is a practice that deepens our understanding of bees in their

natural habitat. Beekeepers gain firsthand insight into bee behavior and ecology, while the traditional skills required for hive construction and maintenance enhance their connection to nature. By integrating this ancient practice into modern forestry and conservation efforts, tree beekeeping offers an innovative and sustainable approach to safeguarding pollinators and enriching forest ecosystems.

The nest of a young bee colony in a new log hive. The constructed combs serve the colony for several years.

A bee colony in the tree-beehive preparing to swarm. Bees living in the forest make reproductive decisions based on the weather and the availability of food sources in a given year.

Damage to tree beehives during winter caused by bears and woodpeckers. In the photo, an oak log damaged by a bear, exhibited in the "Shulgan Tash" National Park.

Modern method of inspecting log hives using a ladder. Made of aluminum, they are foldable, lightweight, and convenient for inspections.

Tools used for building tree-bee hives. They were handmade by craftsmen (blacksmiths) based on patterns preserved in museums and open-air museums