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NYBG Scientists and Colleagues Document the Multifaceted Roles the Sun Plays in the Lives and Beliefs of People on a Remote Pacific Island, from Cosmology to Time-Reckoning and the Layout and Orientation of Gardens and Houses

New Study Published Online by *PLOS ONE* Represents a Significant Achievement in Supporting Indigenous Knowledge and Traditional Practices



The sun plays many roles in the lives and beliefs of Indigenous people on Tanna, an island in southern Vanuatu in the South Pacific. Flowers known in the local language as *nougemet* (left, *Mirabilis jalapa*) and *triklok* (right, genus *Sida*) open gradually during the day. When they are fully open, people know it is time to stop working. (Photos by Dominik M. Ramik)

Bronx, NY—In a significant achievement in preserving and supporting Indigenous knowledge and traditional practices, three scientists at the New York Botanical Garden (NYBG) and their colleagues have documented the multifaceted roles that the sun plays in the lives and beliefs of people on Tanna, an island in southern Vanuatu, a nation of 80 islands in the South Pacific. Their findings were published today by the highly regarded online scientific journal *PLOS ONE* in a research paper titled “‘The children of the Sun and Moon are the gardens’—How people, plants, and a living Sun shape life on Tanna, Vanuatu.”

“On Tanna, the sun is not a distant celestial body, but rather an active player in the biosocial, multicultural landscape of the island,” the authors write. “It provides information—either directly or transmitted through plants or the land—guiding people in time-reckoning, agriculture, architecture, and more.”

The paper's lead author is Michael J. Balick, Ph.D., Vice President for Botanical Science and Director and Senior Philecology Curator of NYBG's Center for Plants, People and Culture. Co-authors include Gregory M. Plunkett, Ph.D., Senior Curator of the Center for Plants, People, and Culture; K. David Harrison, Ph.D., NYBG Affiliate Scientist and UNESCO Chair in Environmental Leadership, Cultural Heritage, and Biodiversity at VinUniversity in Hanoi, Vietnam; independent scholar Neal Kelso; and Vanuatu-based investigators Dominik Ramík, Ph.D., Nadine M. Ramík, Iahwa Kausas Nemisa Kumas, and Presley Dovo.

Based on extensive interviews with Indigenous Tanna residents starting in 2016, the researchers compiled a series of oral narratives of a mythological-historical past involving the sun. In the cosmology of Tanna, the sun is a living, interactive being, both a creative and destructive force that is sometimes viewed as an active, personified character and in other circumstances appears as an instrument created and used by greater powers.

Residents also described contemporary practices that are influenced by the sun. In the tropical Pacific Islands, plant-centered cultures continue to thrive—even as they adopt modern technologies—by using their skills and knowledge to extract maximum value from the plant world, which is dependent on sunlight.

For example, flowers known in the local language as *nougemet* (*Mirabilis jalapa*) and *triklok* (genus *Sida*) open gradually during the day. When they are fully open in the late afternoon, this signals that people should stop working.

Tanna residents also lay out their gardens and other plantings by taking exposure to the sun into consideration. Coconut palms are planted in sunny places; several varieties of taro, a tropical root vegetable, thrive in low-lying gardens with more shade. Yams are planted so that the head of the tuber that protrudes above the ground points to the morning sun. Indigenous islanders told the researchers they grow better this way.

Likewise, the sun is frequently at least one factor in determining the orientation of traditional houses. In villages where the houses are oriented with their longer sides pointing north-south, the rationale is often that the sun will shine on both halves of the roof for most of the day, evaporating moisture from the thatched roofs so they remain dry and thus rot-free for much longer. This orientation also makes it easier for the prevailing winds from cyclones to pass through the openings of the end walls, reducing the risk that the houses will be blown apart.

On parts of Tanna's east coast, however, houses are generally oriented east-west, based on the logic that the sun can shine directly into a house in the morning to warm it up.

Although these Indigenous societies are remarkably resilient, much of their knowledge about plant-based technologies, skills, and lifeways is maintained by older generations. The research team believes it has a unique but fleeting opportunity to learn from ancient cultures on the cusp of radical technological change and, through outreach programs, help teach local communities about the ongoing importance of such knowledge. What Indigenous experts know about plants, seasonality, and sustainability has immense value for a world coping with environmental degradation and the effects of climate change.

“These solar relationships, in their present state, are dependent on the maintenance of local languages, cosmology, and epistemology,” the authors write. “Conscientious support for Indigenous languages, stories, lands, and other cultural practices are paramount as Indigenous people seek both to maintain their traditional ways and to adapt to a rapidly changing world.”

Research on the role of the sun on Tanna islanders’ lives is part of NYBG’s *Plants and People of Vanuatu* multidisciplinary project, co-led by Drs. Plunkett and Balick along with a diverse group of plant scientists, ethnobotanists, mycologists, cultural specialists, linguists, and staff at the Vanuatu Department of Forests and Vanuatu Cultural Center. They work together with Indigenous communities in Vanuatu to help document its plant life and preserve highly valued yet fragile traditional knowledge about plants, with the goal of keeping this vital element of cultural memory alive through continued practice. Projects such as these recognize that Indigenous people and local communities that manage an estimated 25 percent of all lands on Earth are essential partners in the global effort to preserve biological diversity and foster sustainable lifestyles.

In addition to the New York Botanical Garden and the Vanuatu Department of Forests, this research was supported by the U.S. National Science Foundation (Grants DEB 1555657 and 1555675) and Velux Stiftung (Grant 1288).

“The children of the Sun and Moon are the gardens’—How people, plants, and a living Sun shape life on Tanna, Vanuatu” is available on *PLOS ONE* at the following link: <https://doi.org/10.1371/journal.pone.0313997>

About the New York Botanical Garden

The New York Botanical Garden (NYBG) has been a connective hub among people, plants, and the shared planet since 1891. For more than 130 years, NYBG has been rooted in the cultural fabric of New York City, in the heart of the Bronx, its greenest borough. NYBG has invited millions of visitors to make the Garden a part of their lives, exploring the joy, beauty, and respite of nature. NYBG’s 250 acres are home to renowned exhibitions, immersive botanical experiences, art and music, and events with some of the most

influential figures in plant and fungal science, horticulture, and the humanities. NYBG is also a steward of globally significant research collections, from the LuEsther T. Mertz Library collection to the plant and fungal specimens in the William and Lynda Steere Herbarium, the largest such collection in the Western Hemisphere.

The plant people of NYBG—dedicated horticulturists, enthusiastic educators, and scientific adventurers—are committed to helping nature thrive so that humanity can thrive. They believe in their ability to make things better, teaching tens of thousands of kids and families each year about the importance of safeguarding the environment and healthy eating. Expert scientists work across the city, the nation, and the globe to document the plants and fungi of the world—and find actionable, nature-based solutions to the planet’s dual climate and biodiversity crises. With eyes always looking forward, they train the next generation of botanists, gardeners, landscape designers, and environmental stewards, ensuring a green future for all. At NYBG, it’s nature—or nowhere.

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The New York Botanical Garden is located at 2900 Southern Boulevard, Bronx, New York 10458. For more information, visit nybg.org

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