

With Gregory M. Plunkett and Michael J. Balick  
from the New York Botanical Garden

# Calendar Plants

For most of us, calendars rule our lives. They allow us to organize our days, weeks and months, to remind us of future appointments and conversations, to schedule our work and personal activities, and importantly, to carve out a space when we can take a break from the frenetic pace of life. Calendars may hang on our walls or sit on our desks, and increasingly, they are stored on our computers or mobile phones, but this modern tool developed and evolved over a long period of human history. The earliest known calendar, thought to date to ca. 8,000 BC, was recently discovered in Scotland by a team of archeologists. It consisted of a series of 12 pits aligned with the phases of the moon. Scientists believe that the prehistoric people who designed this structure used it to track changes in the seasons, guiding them in their hunt for game and in gathering food plants. This carefully thought out system was the first to use precise observations of celestial bodies, in this case the moon, to organize people's livelihoods. Five thousand years later, along the Nile River Valley, the ancient Egyptians developed a calendar based on movement of the sun, dividing the year into 12 months and 365 days. Throughout history, this calendar was adjusted and refined, most notably by Julius Caesar, whose Julian calendar took effect in 45 BC, and again by Pope Gregory XIII in 1582, whose Gregorian calendar is still used today.

Before the introduction of the Western calendar, people in Vanuatu reckoned time through their own observations of the natural world. Especially important were certain species of 'calendar plants', whose flowering or fruiting provided an indication of the change of seasons and cues for certain activities, such as gardening, hunting, and fishing. The use of plants as a guide for human activities

is of great interest to us. During the past two years, we have been privileged to work with a team of people focused on understanding the diversity, distribution, uses, linguistics and conservation of the Vanuatu flora. Our work on the Tafean islands of Tanna and Aneityum involves collecting plants, mapping plant distributions and gathering information on the local names of these plants and how people use them. During our field research, we were excited to learn that a large number of plants on these two islands serve as calendar plants and play a vital role in traditional Ni-Vanuatu life. For example, during a recent trip to Yakel village in Tanna, we learned that a small tree known as nakul in the Nahual language is used as a calendar plant. When this tree makes tiny white flowers, the local people know that it is time to plant sweet potatoes (*Ipomoea batatas*). This same plant, known as *Boehmeria platyphylla* by botanists, is called nukuas in the Neuai language of southwestern Tanna. In that region, the flowering of this plant indicated to local farmers that the important food plant taro (*Colocasia esculenta*) is ready to harvest. In nearby Aneityum, the flowering of another plant (*Gardenia tannaensis*), known as neroa in Aneityumese language, also signifies that taro is ready to be harvested. For traditional gardeners, it is necessary to pay attention to the flowering and fruiting patterns of many different species of plants because some native species are limited to only certain parts of an island, or may be found only at particular elevations. Thus, the flowering time of several other native species of plants also provides signs that the taro may be ready to harvest. These include the tree *Geissois denhamii* (nekroa in the language of Aneityum) and *Metrosideros collina* (nawawa in the Nafe language of



Tanna). Similarly, the flowering or fruiting of other plant species may provide cues to the planting or harvesting of other garden crops. In West Tanna, for example, when the fruits of *Murraya odorata* (nipina in the Natuar language) turn red, the yam harvesting season has arrived.

Marine resources provide another important source of food in Tafea province, and calendar plants can also help local people coordinate the timing of harvesting these animals. Sea turtles are a highly valued source of food, and the appearance of the yellow flowers of the herb *Melanthera biflora* (called intop asiej on Aneityum) provides an indication to the local people that sea turtles are very fat and ready to be hunted. This small plant, known in English as the 'sea daisy', is commonly found along the beach and other coastal areas, where it is tolerant of the ocean's salt spray. Like many plants in Vanuatu, it has other traditional uses. Its leaves can be cooked and eaten, or used as a food wrap for fish cooked in an earth oven. *Hedycarya dorstenioides* (kapuapu in the Nafe language of Tanna) is another marine calendar plant; the flowering of this tree indicates that it is time to harvest sea urchins.

Even the changes of seasons have botanical cues. When the needles of the ubiquitous seaside tree *Casuarina equisetifolia* (inya in the Aneityum language and 'she oak' in English) turn brown, it indicates that the season of higher temperatures has arrived, and that people should not





**Previous page:** *Melanthera biflora*, known as intop asiej in Aneityum. When it flowers there, local people know that sea turtles are very fat and ready to be hunted. **This page top left:** Kenneth Keith (right) and Titiya Lalep (left) teaching Gregory Plunkett (center) about the names and uses of plants collected on Aneityum, while a young member of the community listens. **Top right:** *Casuarina eqisetifolia*. When the needles of the seaside tree inya turn brown, local people on Aneityum know that a season of higher temperature has arrived and they should adjust their work schedules accordingly. **Bottom right:** *Urena lobata*, the appearance of the pink flowers of namaka' on Aneityum are a traditional indication to local people that the cyclone season has passed.

work as hard as they do during other times of the year, or they will not feel well. Conversely, the flowering of the orchid *Epipogium roseum* (kuanne-teadem in the Neuai language) is an indication that the cold season is arriving in Southwest Tanna. In Aneityum, when the herb *Urena lobata* (namaka' in the Aneityum language) has flowers and fruits, the danger of cyclone season has passed.

These are only a few of the many calendar plants that are used by the people of Vanuatu in their traditional reckoning of time and seasons. But like so much of life in the Pacific, these traditions are threatened by climate change. With changes to the patterns of plant distribution and abundance, including flowering and fruiting times, how will Ni-Vanuatu know the proper times for their subsistence activities? Will the flowering and fruiting schedules of plants still be a reliable guide to seasonal endeavors? This is yet another reason to be concerned about the impacts of global climate change on people around the world, and especially in the beautiful archipelago of Vanuatu.

*Drs. Michael J. Balick and Gregory M. Plunkett are scientists at the New York Botanical Garden who study plants from the world's tropical regions, along with their uses by local people. Four years ago, they helped to initiate a project to document the diversity and uses of the plants of Vanuatu, working with members of the Vanuatu National Herbarium (including curator Chanel Sam and assistant curator Philemon Ala), the Department of Forestry (especially Presley Dovo), and the Tafea Kajoral Senta (especially Jean-Pascal Wahe). The group began working in the southern province of Tafea, where plant diversity is known to be particularly significant,*



*comprising as much as 50% of all the plant species found in the country. They gratefully acknowledge the local people of Tanna and Aneityum who have provided this information, including Jimmy Iauimam, Toata Rupiim, and Toata Nalpalep (from Yakel village) John Pasua, Samuel Herwaen, Joseph Kema, and Benjamin Tom (from the Yenhup area), Jony Konapo, Nufunu Sakama, George*

*Turiak, Jack Nakweren, Sam Nauka, Alick Raviris, Tom Kahi, Johnson Kamkari, Kasumartin, and Moses Kahu (from the latukwei area), Lui Noamel, Joe Natuma, David Tao, Jack Iawiah, and Natua Harry (from Lukwaria), Rawi Ames, Kaias Yauiko Nerkahoro, and Kasu Janet (from Ienehepe), and Titiya Lalep, Reuben Neriam, Kieth Yaiyaho, Wopa Nasauman, and Charlie Nafarniyang (from Aneityum).*