

# Peculiar Mushroom Cultivation on Sago Palms in Solomon Islands

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Recent research by the Society of Sago Palm Studies reported that three types of sago palms, *Metroxylon sago*, *Metroxylon salomonense*, and *Metroxylon warburgii*, grow in the Solomon Islands. In the Solomon Islands, sago palms are mainly used for food (fruit and starch), construction materials (leaves, barks, and stems for roof, wall, and floor materials), and carvings, handicrafts, or sinkers (from seeds). Moreover, people in the Solomon Islands cultivate and eat mushrooms that grow in the sago palm's decayed stem, which becomes a fungal bed for wild-type mushrooms. Although this practice was known, the actual conditions, such as wild-type mushroom (*Volvariella sp.*) cultivation methods, had not been clear.

The Japan International Cooperation Agency Technical Cooperation Project on Capacity Development for Sustainable Forest Resources Management in the Solomon Islands set up two pilot sites. Komuniboli, a village in Guadalcanal Province, is one of the project's pilot sites, where clustered sago palm forests exist and are under villagers' forest management, including mushroom cultivation. Mushroom cultivation in Indonesia and Papua New Guinea has been conducted by leaving the fallen stem of the sago palm and waiting for mushrooms to grow in the fungus bed after starch extraction from the sago palm's residue, as Dr. Barahima Abbas revealed in his article "Morphological Characteristics and Nutritional

Values of Wild Types of Sago Mushrooms (*Volvariella sp.*) That Grow Naturally in Manokwari, West Papua" in December 2015. However, in Komuniboli, sago palms are felled for the main purpose of leaf harvesting for roof materials and mushroom production without extracting the sago palm's starch. This village's mushroom cultivation is a rare case.

Komuniboli is located in the tributary basin of the Mbokokimbo River in Guadalcanal, about 50 km east of Honiara, the capital city of the Solomon Islands. The altitude of the village and its surrounding area is 30–70 m above sea level, and the soil type is mainly laterite / silty clay. The village community owned approximately 350 ha of forest land, and the forest has a long and thin topography sandwiched between a stream and a relatively large swampland. In the forest area, several small ridges and valleys exist, and the valleys are generally wet. Approximately 1,000 *Metroxylon salomonense* and *Metroxylon sago* are present in the wet places. Natural regeneration of these sago palms might have been repeated, because appropriate gaps exist in the forest. Villagers know that sago palms grow only in poor drainage areas, and they manage the sago palm forests while using maintained sago palms appropriately.

The villagers have long used sago palms for housing materials and food and to continually produce wild-type mushrooms (*Volvariella sp.*). After a sago

palm is felled, small mushrooms form from mycelium on several points of the decayed stem. When the mushrooms become suitable in size, the people harvest, cook, and eat them. These mushrooms have never been sold outside the community. The villagers know the sago palm stem's decay speed after felling, the length of time until mushrooms grow, the mushroom harvest yield, and so on. Therefore, as long as a healthy sago palm forest is maintained, mushroom cultivation will probably continue.

The mushroom cultivation process is as follows: (1) cut down a sago palm at an appropriate time for the purpose of harvesting the leaves for housing materials, (2) expand the area of the stem's starch surface to promote decay by natural rainfall, (3) find small mushrooms grown from their mycelium, and (4) harvest the mushrooms after formation of the mature mushroom shape. In (2), the villagers use their mushroom cultivation skills. They intentionally remove the bark from a certain area of the felled sago palm using a bush knife, thus promoting the stem's decay by rainfall, after predicting the required mushroom yield.

By cutting the top side of the tree trunk as well as the bottom, the decay progresses from both sides, and it becomes possible to collect many mushrooms. If the stem is cut into pieces of several meters, a great

number of mushrooms can be collected at one time because stem's decay proceeds from both cross sections. For example, when cutting a sago palm about 20 m in height, if a villager proceeds to decay them from both the root and top side of the stem, wild-type mushroom harvesting can be continued for approximately one year. After felling, the period required to acquire sufficient decay for cultivating mushrooms is about two or three months, but the decay speed also differs between young and old sago palms.

The important point in Komuniboli's mushroom cultivation is that they villagers maintain and manage their sago palm forest while moderately utilizing the sago palms. A common species of sago palm takes approximately 10 years to mature and survives for 40 years. Sago palms generally maintain their number and planting area by natural regeneration, but it is difficult to artificially plant and grow sago palms because they only bear fruit once before dying. Because the planting area and the number of sago palms are decreasing in the Solomon Islands, establishing a sustainable cultivation and protection system is necessary. Since the challenge of sago palm conservation overlaps with sustainable forest resource management, the survey of mushroom cultivation using the sago palm stem as a fungal bed will be continuously conducted in the village.



**Fig 1.** Study of mushroom cultivation with sago palm stem