

SOUTH PACIFIC NEWSLETTER

March 2023 No.34



KAGOSHIMA UNIVERSITY
INTERNATIONAL CENTER FOR ISLAND STUDIES
(formerly RESEARCH CENTER FOR THE PACIFIC ISLANDS)

CONTENTS

Page

Introducing My Research	
YAMAMOTO, S.: International Center for Islands Studies, Kagoshima University.....	1
Research Seminars	6
Recent Publications	12

Cover photo: Meal at Amami in Chinese New Year by Amami Traditional Meal Study Group
(by KAWAI Kei)

INTRODUCING MY RESEARCH

Food Culture in Micronesia

YAMAMOTO, Sota

International Center for Islands Studies, Kagoshima University

Introduction

The Federated States of Micronesia (FSM) is composed of approximately 600 small islands lying just above the equator in the Western Pacific, and consists of four states: Yap, Chuuk, Pohnpei, and Kosrae (from west to east). Prior to the 1950s, the people of the FSM ate a “traditional” food based on staple starchy crops (e.g., breadfruit, root and tuber crops, banana) and marine resources (e.g., fish, octopus, clams, turtles, land and coconut crabs). By the 1960s, the traditional diet was being replaced by a modern diet consisting of rice, flour, sugar, fatty foods, and various imported and processed foods after the United States Department of Agriculture initiated a supplementary feeding program. This phenomenon was accelerated by the Migration, Remittance, Aid, and Bureaucracy (MIRAB) economy, a cash economy mainly consisting of migrated workers’ remittance and salary of bureaucratic workers funded by aid from the United States. A Compact of Free Association agreement was signed between the FSM and the United States in 1986. Since then, the FSM has faced serious public health problems, such as obesity, diabetes mellitus, hypertension, cardiac disease, and vitamin A deficiency, due to the modern diet and other lifestyle changes. Therefore, some dietary surveys have been conducted in Micronesia, but only for a short period of time. Long-term studies are necessary to understand dietary habits in Micronesia, whether they are traditional or modern. Thus, I conducted a detailed evaluation of household food consumption at every meal over 4 to 5 years in Chuuk and Pohnpei states, the FSM.

Study Sites and Data Collection

Piis-Paneu Island, located on the ring reef of Chuuk Atoll (Fig. 1), is < 1 km² in area. The whole island lies just above sea level, and houses are scattered throughout the island with three patches of *puna* (*Cyrtosperma merkusii*; giant swamp taro) at the center of the island. About 45 households reside on the island, which has a population of approximately 320. The average income surveyed in 2013 was approximately USD 8,000 per year. Although Piis-Paneu Island is the most distantly inhabited island from Weno Island, the capital and commercial center of Chuuk State, on Chuuk Atoll, it takes 1 hour to travel from Piis-Paneu Island to Weno Island in a small boat with an outboard motor. Therefore, people living on Piis-Paneu Island frequently visit Weno Island to shop, sell marine resources, and go to school or work.

Pingelap Atoll has three islets, Pingelap, Deke, and Sukoru islands, which have a total area of 1.8 km² (Fig. 1). Of the three, only Pingelap Island is inhabited and the inhabitable area extends from the shoreline to a patch of *mweiang* (*C. merkusii*) at the center of the island. There are about 58 households on Pingelap Island, which had a population of 239 and an average income of USD 3,000 per year in 2012. Pingelap Atoll is about 270 km from Pohnpei Island, the center of Pohnpei State and site of the capital city Kolonia, and about 120 km from the nearest inhabited atoll, Mokil Atoll. There is a 300 m airstrip on Pingelap Island, and Caroline Islands Air flies a light aircraft to the island, but flight schedules are irregular and the price of a one-way ticket is USD 190 (in August 2018), which is expensive for the islanders. The government operates a ship that connects the outer islands in Pohnpei State with Pohnpei Island, and it costs approximately USD 15 per person, a reasonable price compared with the airfare, to travel from Pohnpei Island to Pingelap Island. However, the ship visits the island only a few times a year. The access to Pingelap Atoll is very limited.

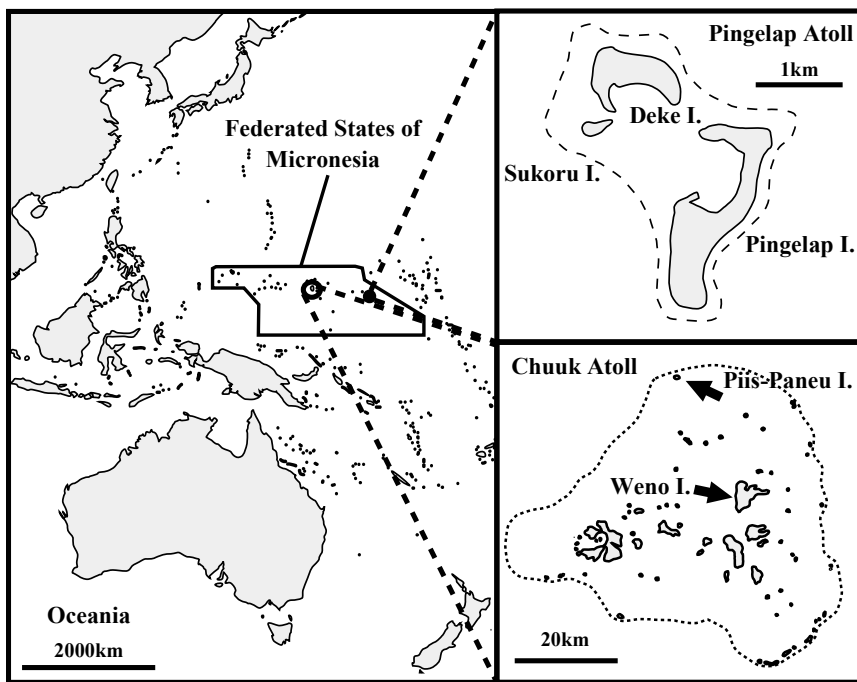


Fig. 1. Study sites in Chuuk and Pohnpei states, the Federated States of Micronesia.

A total of 57 and 154 inhabited areas in Piis-Paneu and Pingelap islands, respectively, have been identified (based on traditional land classification), including sites that were vacant at the time of our survey. Edible plants at each site were documented in August 2013 to explore the frequencies of crops and other edible plants in home gardens. The frequency of each plant was

calculated as follows: Frequency (%) = (total number of sites at which each useful plant was found / 57 sites) × 100.

One household was selected to survey dietary patterns based on the average family size and income on each island. Questionnaires were distributed to explore the foods consumed at every meal. The frequency of consumption of each item per month was calculated as follows: Frequency (%) = (total number of meals at which an item was consumed/total number of meals in 1 month) × 100. Data on food consumption were collected from 2013 to 2017 on Piis-Paneu Island and from 2014 to 2018 on Pingelap Islands.

Edible plants and their frequencies in home gardens

More than 30 species of edible plants were recorded in home gardens of Piis-Paneu Island. *Artocarpus* spp. (breadfruit) and *Cocos nucifera* (coconut) were the most common (91.2%), followed by *Musa* spp. (banana) (87.7%), *Citrus* spp. (citrus) (54.4%), and *Pandanus* spp. (pandan) and *Syzygium* spp. (both 49.1%). These top six crops are very important in daily life, yielding starchy staples, fruit, drink, and condiments; material for food-wrapping; and raw materials for handicrafts, canoes, and construction. Of the root and tuber crops, *Alocasia macrorrhizos* was the most common (47.4%), followed by *Xanthosoma sagittifolium* (arrowleaf elephant ear) (28.1%), *Ipomoea batatas* (sweet potato) (14.0%), and *C. merkusii* (10.5%). Among fruits other than the top six crops, the frequencies of *Carica papaya* (papaya) (43.9%) and *Crataeva speciosa* (garlic pear) (31.6%) were high but those of others were very low. Vegetables such as *Cnidoscolus chayamansa* (29.8%), *Cucurbita* sp. (pumpkin) (29.8%, the leaves were also eaten), and *Alternanthera sissoo* (12.7%), and spices and herbs such as *Capsicum* spp. (chili pepper) (15.8%) and *Ocimum tenuiflorum* (holy basil) (14.0%, principally used for decoration), were sometimes found in home gardens, but other vegetables were rarely cultivated (all frequencies below 3.5%).

More than 25 species of edible plants were observed in home gardens of Pingelap Island. *C. nucifera* was present at the highest frequency (82.8%), followed by *Musa* spp. (79.0%), *Pandanus* spp. (66.9%), *Artocarpus* spp. (52.9%), and *C. papaya* (44.6%). The frequencies of root and tuber crops were low. They included *C. merkusii* (8.3%), *Dioscorea* spp. (yam) (7.0%), *X. sagittifolium* (6.4%), *Colocasia esculenta* (taro) (1.9%), and *I. batatas* (1.3%). This is partly because there is a big patch of *C. merkusii* on the island and it is difficult to cultivate some crops, e.g., *Dioscorea* spp. which are one of the most important crops in Pohnpei Island, due to alkali soil derived from coral. *A. macrorrhizos* (12.1%) and *Tacca leontopetaloides* (1.9%), which were regarded by villagers as famine food, were found in home gardens as both cultivated and spontaneous forms. *Citrus* spp. (28.7%) and *Capsicum* spp. (28.7%) were very important condiments, thus they were grown frequently. However, the frequencies of other fruit trees, vegetables, and spices were low, except for *A. sissoo* (12.7%) and *C. chayamansa* (10.8%), which are native to the Americas and consumed as vegetables.

Dietary patterns and food consumption

The household on Piis-Paneu Island often consumed imported foods, especially rice (94.5%; 5-year average), canned fish (19.6%), and instant noodles (33.6%), suggesting that their dietary patterns have become “modern”, at least to some extent. However, they also ate local starchy crops (breadfruit 27.5%, banana 26.5%, and *puna* 12.7%) and local marine resources (fresh fish 78.9%, dried fish 36.6%, and others 8.8%) at high frequencies. The 5-year study confirms that the dietary patterns of Piis-Paneu Island seem to be basically “traditional”, with the addition of “modern” food, rather than lying between “traditional” and “modern” (Fig 2). During the survey period, a huge typhoon (Category 5 intensity on the Saffir-Simpson Hurricane Scale) hit Piis-Paneu Island at the end of March 2015. Some people took refuge from the strong winds and high waves in a school building. Huge high waves hit the southern part of the island twice; several houses were completely destroyed, whereas others were partially destroyed. It is revealed that this huge typhoon had a devastating impact on the production of some crops, especially breadfruit, on the island, and the frequency of breadfruit consumption did not return to a normal level even 3 years after the typhoon. It is necessary to manage famine food, such as *A. macrorrhizos* and *T. leontopetaloides*, or naturalized plants on each island, and to pass traditional knowledge of these plants to the next generation as a precaution for food shortages caused by typhoons or other natural disasters.



Fig. 2. Local and imported food served in Sep. 2013, Piis-Paneu Island. Upper (from left to right): imported instant noodle, banana, and soup with *tango* (a Japanese sweet dumpling). Lower (from left to right): imported rice, breadfruit, shell meat, and lobster.

The 4-year average of the frequency of consumption of starchy staples was highest for imported rice (47.4%), followed by banana (37.4%), breadfruit (19.9%), *mweiang* (16.3%), and

imported wheat flour (12.5%) in Pingelap Island. The monthly variation in the consumption of rice and wheat flour was much greater than the annual variation. The household ate banana in all months during the survey period and banana was the most frequently consumed local starchy staple on Pingelap Island, suggesting that banana supports subsistence on this small, remote island throughout the year. The additional value of the 4-year average frequency was 60.7% for imported starchy staples and 73.6% for local starchy crops, indicating that the household still relied on local starchy crops for more than half of the total starchy staples consumed by frequency. Among marine resources, the 4-year average was highest for fresh fish (69.9%), followed by other marine resources (1.3%), imported canned fish (1.0%), and dried fish (0.5%). Regarding meat, the 4-year average was highest for local fresh meat (2.3%), followed by imported canned meat (0.7%), and imported fresh meat (0.1%). These results suggest that the main source of protein on the island is fresh fish caught locally. The frequency of the consumption of imported instant noodles was low. The dietary pattern on Pingelap Island was still traditional compared with Pohnpei Island, probably due to the very limited access from Pingelap Island to the main island of Pohnpei where imported food products are abundant (Fig. 3).



Fig. 3. Local and imported food served in Aug. 2010, Pingelap Island. Upper (from left to right): grilled fish, grilled fish, breadfruit, and imported rice. Lower (from left to right): dipping sauce (soy source with fruit of chili pepper) and *mweiang*.

If you would be interested in more detailed results of my study, please see the below papers.
YAMAMOTO, S. 2019. Long-term survey of food consumption on Pingelap Island, Pohnpei State,

- the Federated States of Micronesia. *The Journal of Island Studies*, 20(2): 141-154.
- YAMAMOTO, S. 2018. Long-term food consumption survey on Piis-Paneu Island, Chuuk State, the Federated States of Micronesia. *The Journal of Island Studies*, 19(2): 115-126.
- YAMAMOTO, S., KAWANISHI, M. and NISHIMURA, S. 2015. Dietary patterns and food consumption in the Federated States of Micronesia: A case study conducted on Piis-Paneu Island, Chuuk Atoll, Chuuk State. *Tropical Agriculture and Development*, 59(4): 170-178.
- YAMAMOTO, S., KAWANISHI, M. and NISHIMURA, S. 2015. Dietary patterns and food consumption survey in the Federated States of Micronesia: A case study in Pingelap Island, Pohnpei State. *Tropical Agriculture and Development*, 59(4): 161-169.
-

Research Seminars

No.217, 7 March 2022

“Recent Archaeological Research of Ancient Human Evidence in the Southern Ryukyu Islands, Southwestern Part of Japan Archipelago”

YAMAGIWA Kaishi (Research Institute of Islands and Sustainability, University of the Ryukyus)
[ABSTRACT]

This presentation will introduce the recent archaeological research of ancient human and material culture in the Southern Ryukyu Islands. The Southern Ryukyu Islands (also called Sakishima or Miyako and Yaeyama Islands) is southwestern part of Ryukyu Islands, the southern region of Japan archipelago. This region has a different culture and history from the Ryukyu Islands north of the Okinawa Islands, and has been shown to have regional characteristics in language and genetic traits. In recent years, human bone fossils from a very old period (approximately 30,000 years ago) have been discovered in this area, some morphological and genetic analyses have shown that these people have a population origin different from that of the Japanese archipelago. Since the Southern Ryukyus is adjacent to mainland China; Taiwan; and the Philippines; most archaeological and anthropological studies have been focusing on human migration and cultural interaction with these surrounding areas since such older period, and considered that such diverse origin caused the regional character of this region. On the other hand, cultural characteristics that are difficult to explain by simple origin relationships have been identified in the southern Ryukyu Islands, and in recent years, new research has also been conducted to approach the process and mechanism of the formation of unique cultures in the region, such as environmental uniqueness and diversity and adaptive behavior to them. This multifaceted research movement shows the possibility of developing comparative studies with various island regions, and is expected to lead to more extensive and advanced island research.

No.218, 1 April 2022

“Efforts to Protect the Health of Remote Island Residents as a University”

TAKEZAKI Toshiro (Community Medicine Support Center, Kagoshima University Hospital)
[ABSTRACT]

Health, medical and welfare organizations and the government are responsible for direct efforts to “protect the health of remote island residents”. This lecture will introduce the efforts to protect the health of remote island residents conducted through education and research while I was enrolled in the Department of International Island and Community Medicine.

As an education, we started to let all medical students learn community medicine in islands. As a result, the community medicine in islands that had been special has become one that everyone knows. In addition, the students who entered the school with the obligation to take charge of community medical care had the experience on additional training in island, and the practices in islands spread to nurse and dentistry students. In terms of research, we started population-based epidemiological research in 2005 to prevent lifestyle-related diseases on five islands in Amami, continue until 2035. By conducting ongoing research on remote islands, we have established data and human networks that will be the basis for solving health issues faced by the region, and have gained knowledge that is of interest to academically. In addition, research on islands has become an attractive place to train researchers, and we were able to attract and nurture young researchers who are interested in community medicine in islands. The research base on the remote island also led to a place where universities can contribute academically to solving the health issues of residents, and received many commissioned research, and the analysis results were fed back to the administration and residents of the remote islands. In addition, the remote islands have become a place for international human resource development for health care.

No.219, 30 May 2022

“Plant diversity of Kagoshima to Southeast Asia”

TAGANE Shuichiro (The Kagoshima University Museum, Kagoshima University)

[ABSTRACT]

Vascular plants, with ca. 400,000 species, have diversified and adapted to the various environments in the world and are an important element in our life and ecosystem. Despite its importance, our knowledge on the local flora is still poor, and ca. 2,000 new plants are discovered or described every year.

In this presentation, I will introduce plant diversity of the Kagoshima Prefecture and Southeast Asia, both of which are known as diversity hotspots, and some activities to elucidate the local flora there.

No.220, 27 June 2022

“Maintenance Mechanism of Fruit Dimorphism Related to Seed Dispersal of Coastal Plant, *Scaevola taccada*”

EMURA Naoko (Faculty of Agriculture, Kagoshima University)

[ABSTRACT]

For sessile plants, seed dispersal is the only way to colonize new sites and expand their ranges. The seeds of individual plants have suitable fruit traits for specific dispersal vectors such as wind, water and animals. The environment in which seeds are dispersed tends to vary depending on the dispersal vector. A phenomenon has been observed in some plant species that they would have speciated with the acquisition of fruit morphology to adapt to a new dispersal vector when they invaded a new habitat environment where the original dispersal vector was absent. However, the

process of this phenomenon is mostly unknown.

I found the fruit dimorphism (inter-individual variation) of a coastal shrub, *Scaevola taccada* (Goodeniaceae), individual plants produce either cork-morph or pulp-morph fruits. The former is buoyant and common on sandy beaches, whereas the latter does not float, is bird-dispersed, and is common on sea cliffs. This plant can be expected to be a suitable study material for understanding the early processes of speciation resulting from the evolution of seed dispersal traits. In this presentation, I will introduce my research conducted so far with the aim of understanding the maintenance mechanism in which the two morphs of *S. taccada* exist.

No.221, 19 July 2022

“High-pressure Experiment and Observation of Chlorite in the Area Where Inter-mediate Earthquakes Occur”

YAMAUCHI Sachiko (International Center for Island Studies, Kagoshima University)

[ABSTRACT]

Inter-mediate earthquakes occur in the interior of the subduction zone plate (at depths of about 60 to 300 km). These occur in areas where earthquakes should not theoretically occur, and their causes have not yet been clarified. The islands of Kagoshima Prefecture are located along the Philippine Sea Plate. In 1911, an earthquake with a magnitude estimated to be 8.0 occurred there. They have not been verified and cannot be predicted, although there are some strong hypotheses. Since the area where chlorite exists and the area where inter-mediate earthquakes occur are almost the same, we hypothesized that the behavior of chlorite is the cause and conducted an experiment. In this presentation, I want to introduce the structural change of chlorite in the area where inter-mediate earthquake occurs.

Chlorite is a layered mineral. Chlorite is classified into polytypes, which have slightly different properties depending on the way they are layered. It is known that under high pressure conditions, chlorite undergoes a sudden change in the way each layer overlaps one another. Some of these changes are accompanied by polytype changes. Acoustic Emission, a wave similar to seismic waves, occurs more frequently and its energy magnitude increases with this polytype change. In other words, the behavior of chlorite is generating waves like seismic waves. However, since these data were obtained at room temperature, we verified whether this change also occurs under high-temperature and high-pressure conditions.

No.222, 26 September 2022

“Physicians from Okinoerabu Island, the 'Island of Education'”

HIDAKA Yusuke (Regional Management Research Center, Kagoshima University)

[ABSTRACT]

This presentation focuses on physicians from Okinoerabu Island, located in the Nansei Islands of Kagoshima Prefecture.

In previous research on Okinoerabu Island, it is possible to confirm the discourse on Okinoerabu Island as an 'island of education.' It can also be confirmed that Saigo Takamori, Kawaguchi Seppo, Kihira Uemon and other exiles from the Edo period had an influence on the education on Okinoerabu Island. Based on such discourses, narratives such as "there are many teachers and physicians from Okinoerabu Island" can also be confirmed.

However, it has not been confirmed, as far as we know, whether there are actually 'many' of these professions.

In this presentation, we focus on "physicians" specifically among these professions and present the results of a verification based on the Amami Meikan, a social register published by the Amamisha. Through comparison with the number of physicians from other Amami Islands, it will be clarified whether there were "many physicians from Okinoerabu Island" in the Showa period.

In the situation of islands with various restrictions on education and mobility, the physicians from the island of Okinoerabu moved vertically in society (changes in social status) and horizontally in space (continuation of careers outside the island). The conditions that produced such physicians from Okinoerabu Island are also examined from the perspective of the island's social, political and cultural contact with YAMATO (mainland Japan).

No.223, 24 October 2022

“Heirloom Island Radishes on the Verge of Extinction — Amami-Oshima Island ‘Koshi Radish’ and Kikai-jima Island ‘Onotsu Radish’”

NAKANO Hatsunori (Experimental Farm, Faculty of Agriculture, Kagoshima University)

[ABSTRACT]

Heirloom crops have been maintained and developed by adapting to the climate unique to the region, building regional culture through the life of residents and developing human resources. However, as the heirloom crops unique to the region disappear one after another, diversity of genetic resources is disappearing, due to rise of commercial varieties, changing cultivation form, decrease in farmers, and disappearance of villages caused by declining birthrate and aging population. In recent years, the diverse food culture and education rooted in the region are being reconsidered. With the growth of local production for local consumption and health consciousness, these vegetables with regional diversity have been recognized. On the other hand, preserving and enlightening the heirloom crops is an urgent issue.

I surveyed the entire Kagoshima prefecture and collected more than 100 varieties of crops. In almost all regions, heirloom vegetables are replaced by commercial varieties. Moreover, in areas where heirloom vegetables remain, it was only left by elderly people producing their own seeds. In this way, it is necessary to leave these crops with their stories to future generations, since crops have supported the local food culture and people through a long history have value as cultural assets.

In this presentation, I introduce heirloom radishes of south Amami-Oshima island (Setouchi town) and Kikai-jima island.

No.224, 7 November 2022

“Diversity of Banana Cultivars and their Usages in Papua New Guinea”

ODANI Shingo (Faculty of Letters, Chiba University)

[ABSTRACT]

Banana cultivation in New Guinea is important subject to explore the origin of agriculture in human history and the distribution pattern of banana cultivars in the contemporary world. However, studies on bananas in New Guinea have been less numerous than those on sweet potatoes or sago palms. The purpose of this study is to clarify the classification of banana cultivars and usage in the

areas where banana is a staple food; the Markham River basin of Morobe Province and the coastal area of Central Province.

This study focused on the kalapua group, which is generally regarded as a distinct group by local people in both areas; its usage is different from that of the other groups. kalapua is the name of this group in Melanesian Pidgin and some local languages. The genome type of the kalapua group is ABB, and the shape of its fingers is unique; they are short and angled, with a thick peel. Local people regarded the kalapua group as having tolerance to both drying and flood. Categorizations of this group were not conducted in previous studies on the Highlands fringe region; therefore, it is supposed that local people in the lowland regions where banana is staple food especially regard them as indispensable for their subsistence.

We observed that the kalapua group and other group were planted in separate gardens, because informants assess that the growth rate and tolerance to climate differ between kalapua and other cultivars. A nutritional status assessment showed that nutrient levels, except for carbohydrate, are comparatively low in kalapua. It is concluded that farmers classify and produce kalapua and other cultivars separately. kalapua, for their tolerance to both drying and flood, are cultivated for a sustainable staple food. Other bananas may be grown because of their nutritional compositions, preference, and means of a cash income.

No.225, 19 December 2022

“Biodiversity and Biogeography of Obligate Plant Parasites-Rust Fungi in the Ryukyu Archipelago”

OKANE Izumi (Institute of Life and Environmental Sciences, University of Tsukuba)

[ABSTRACT]

Rust fungi (Pucciniales, Basidiomycota) are biotrophic obligate parasites, and ca. 6,000 species in approved 130 genera, 18 families (Cummins & Hiratsuka, 2003; Aime & McTaggart, 2020) have been reported globally. Rust fungi are characterized by 1) unidirectional formation of up to five morphologically and functionally different spore stages (spermatogonial, aecial, uredinial, telial, and basidial stages), 2) including heteroecious species in which two phylogenetically different host plants are required to complete their life cycle, and 3) high host specificity. In Japan, ca. 760 species have been reported (Ono, 2008), of which about 90 species have been reported only from the Ryukyu Archipelago and Kyushu (Hiratsuka et al., 1993). In field surveys conducted mainly by the University of Tsukuba and Ibaraki University, more than 160 species (including many unidentified species of the genus *Puccinia*) have been collected in this region. Of these, ca. 40 species are known to be distributed in the Ryukyu Archipelago and Kyushu. Recent molecular phylogenetic studies have confirmed that *Uredo yuwandakensis* (found uredinial stage only), previously reported only from Amami-Oshima, is parasitic on several *Smilax* spp. in addition to Himekakara (*Smilax biflora*) and is distributed in Chiba Pref. Furthermore, this species was revealed to be assigned to the genus *Puccinia* (Gibu, 2022). *Chrysocelis gynostemmatis*, which had been reported only from Amami-Oshima and Nakanoshima islands, was found on the Amachazuru (*Gynostemma pentaphyllum*) collected in Thailand. It suggests that this species may occur universally on Amachaduru in East and South Asia (Unartngam et al., 2020). *Puccinia kraussiana*, which had not been previously reported in Japan, was found on Sarutoriibara (*S. china*), Satsuma-sankirai (*S. bracteate*), and Karasukiba-sankirai (*Heterosmilax japonicum*) from Amami-Oshima,

Tokunojima, and Okinawa Pref. It is required to reconfirm the distribution of *Hamasporea okinawaensis*, a new species reported on Okinawa-urajiroichigo (*Rubus utchinensi*), which is listed as an endangered species and *Hamasporea acutissima*, which has also been reported on Kuwanohaichigo (*Rubus nesiotis*: an endemic species) distributing in Okinawa, and to compare them based on molecular phylogenetic analyses. Further investigation of the flora of rust fungi in the Ryukyu Archipelago will be very important in elucidating the biogeography and speciation of rust fungi in East, Southeast, and South Asia.

No.226, 16 January 2023

“Medicine and Food - from Satsuma Kurozen to Ninjin’yoito Research”

INUI Akio (Pharmacological Department of Herbal Medicine, Kagoshima University Graduate School of Medical & Dental Sciences)

[ABSTRACT]

The Kagoshima University Food and Health Project aims to contribute to healthy longevity, with special reference to the prevention of lifestyle-related diseases and frailty, a condition requiring a cane, through Kagoshima functional food, the same source as Kampo medicine.

One of the projects is Kurozen (Satsuma Kurozen bento), which incorporates black rice and black vegetables containing rich anthocyanins, won the Excellence Award (2nd place) in the bento category of the 2019 National Supermarket Association. Another is the shochu project, in which we have identified functional ingredients with anti-metabolic effects as well as ghrelin-like substances that work similarly to ghrelin, a hunger hormone secreted from the stomach, that can suppress aging and promotes healthy longevity. Based on these findings, we are now developing functional shochu.

Ninjin’yoito is called the strongest Hozai in Kampo medicine, and it has been reported to show the preventive and therapeutic effects on frailty such as strengthening immune function, promoting appetite, and reducing sarcopenia in the elderly. This Kampo medicine acts to stimulate ghrelin and hypothalamic neuropeptide Y downstream thereof. This hunger system forms the basis of caloric restriction and is deeply involved in healthy longevity, tumor suppression, and stress tolerance.

Kampo medicines contain many kinds of herbal drugs. Chinpi, dried citrus peels, are components of a substantial number of Kampo medicine including ninjin’yoito. One of the origins of chinpi is Sakurajima small tangerine that also contains a lot of active ingredients such as hesperidin which stimulate ghrelin secretion. In this lecture, I will discuss the progress of modern medicine in healthy longevity from the standpoint of the same source of medicine and food.

No.227, 6 February 2023

“Trends in Banana Cultivation and Utilization in the Japanese Islands”

SATO Yasuaki (School of Global Humanities and Social Sciences, Nagasaki University)

[ABSTRACT]

Banana production in Japan was mainly limited to the sub-tropical islands of Ryuku and Ogasawara. Over the past few years, however, attempts have been made to cultivate the fruit in the temperate zones of Kyushu, Shikoku, Honshu, and Hokkaido, which were considered unsuitable

for banana production. This study aimed to review the trends in banana cultivation and utilization in the Japanese archipelago.

The relationship between humans and bananas consists of two major components. One is the indigenous cultures that developed in different tropical and subtropical zones whereas the other is mass production on tropical plantations and mass consumption in the temperate and cold zones. Today, such issues as the global spread of diseases and pests, long food miles, and inequality between producers and consumers are particularly complicated. Against this background, the new developments in Japan can be viewed as a sign of a changed outlook of people in Japan, including the Nansei Islands, and modifications in the flow of banana production and consumption.

Based on newspaper and magazine articles on domestically produced bananas until 2018, banana plantations north of Kyushu can be roughly classified into the following three types. The first is farms that focus on sales to consumers (sales-specific); the second is farms that concentrate more on hands-on activities, such as harvesting events and plant ownership (experience-oriented); and the third is gardens that grow bananas on a small scale as an extension of a personal hobby and at times give them away as gifts or, on rare occasions, for sale. Since 2018, different methods of cultivation and use have been observed, and the exchange of information among banana growers has increased. However, the characteristics of this fruit and its history of spreading through personal networks have made it challenging for growers to identify cultivars.

Recent Publications

+++ **Kagoshima University Tushoken Booklet** +++

No. 17 YAMAMOTO, S. and H. TAKAMIYA, H. (eds.): The Amami Archipelago, Rich in Nature and Culture Resources: Society, Economy and Education (October 2021)

No. 18 YAMAMOTO, S. and H. TAKAMIYA, H. (eds.): The Amami Archipelago, Rich in Nature and Culture Resources: Plants and Animals (October 2021)

No. 19 TSUDA, K.: Save the Island's Specially Tangerine -Eradication of the Whitespotted Longicorn Beetles, *Anoplophora* spp. by an Entomogenous Fungus, *Beauveria brongniartii* in Kikaijima Island- (March 2022)

No. 20 SATO, M.: Nereidid Polychaetes Inhabiting Rivers in the Ryukyu Islands (March 2022)



Kagoshima University Tushoken Booklets No. 17, No.18, No.19, and No.20

KAGOSHIMA UNIVERSITY
INTERNATIONAL CENTER FOR ISLAND STUDIES

1-21-24, Korimoto, Kagoshima, 890-8580 JAPAN ●

TEL: +81-99-285-7394

FAX: +81-99-285-6197

E-mail: shimaken@cpi.kagoshima-u.ac.jp

Website: <http://cpi.kagoshima-u.ac.jp/index.html>

鹿児島大学国際島嶼教育研究センター

郵便番号 890-8580

鹿児島市郡元1丁目21番24号

電話 099-285-7394

ファクシミリ 099-285-6197