

Psychoactive mushroom use in Koh Samui and Koh Pha-Ngan, Thailand

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(Accepted June 14, 1991)

This paper presents the results of recent ethnomycological exploration in southern Thailand. Field observations, interviews and collection of fungi specimens were carried out primarily on two islands, Koh Samui and Koh Pha-ngan, situated in the western region of the Gulf of Siam. Some fieldwork was also conducted in the northern Thai province of Chiang Dao and in the southern Thai province of Surat Thani. During five separate excursions (1989–90), observations were made of occurrence, harvesting, use, and marketing of psychoactive fungi by local Thai natives (males and females, adults and children), foreign tourists, and German immigrants. The first records of psychoactive *Psilocybe subcubensis* and *Copelandia dung* fungi in Thailand are presented in this paper. These fungi exhibited intense bluing reactions when handled, indicating the presence of psilocybin and/or psilocin. Seven collections of *Psilocybe cubensis* (Earle) Singer and/or *Psilocybe subcubensis* Guzman and four collections of *Copelandia* sp. were harvested and sun-dried for herbarium deposit. These fungi are cultivated or occur spontaneously, often appearing in the decomposed manure of domesticated water buffalo (*Bubalus bubalis*) and at least three different species of cattle (*Bos indicus*, *B. guarus*, and *B. sumdaicus*). The psychoactive fungi are cultivated in clandestine plots, both indoors and outdoors, in the uplands and villages on Koh Samui by both Thai natives and some foreigners. The sale of psychoactive fungi directly to tourists and to resort restaurants for use in edible food items such as omelettes and soups is discussed in detail. The preparation and sale of mushroom omelettes adulterated with artificial hallucinogens in some restaurants is also discussed. In addition, the marketing of items such as hand painted T-shirts, post cards, and posters bearing mushroom related motifs in Thailand is described.

Key words: psychoactive fungi; *Psilocybe* spp.; *Copelandia* spp.; psilocybin; *Hed Keequai*; Koh Samui; mushroom omelettes

Introduction

Persistent references in the tourist industry literature call attention to the recreational use of psychoactive fungi in several resort areas of Thailand, including those on the islands of Koh Samui and Koh Pha-ngan. On site observations and personal interviews indicate that numerous restaurants on the islands of Koh Samui and Koh Pha-ngan have been serving psychoactive omelettes, stews, soups, pizzas, teas, and blended juice beverages containing mind-altering, gilled fungi referred to as 'magic mushrooms'. Some of these

commercial establishments also sell herb cookies mixed with psychoactive mushrooms and *Cannabis* ('ganga').

Purchase and use of foods containing psychoactive fungi occurs primarily among tourists and West German immigrants living on these islands. To a lesser degree, use also occurs among other foreigners as well as among some native people (male and female). In addition, some local children also harvest, sell and consume these fungi, sometimes attempting to smoke the mind-altering mushrooms in bamboo pipes. Occasionally a number of restaurants also sell mushroom omelettes containing an artificial hallucinogen. This hallucinogen (possibly LSD-25) is psychoactively more powerful and potentially more dangerous than the psilocybian alkaloids that occur naturally

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in some of the wild or cultivated mushrooms collected locally.

The following paper describes the psychoactive fungi recorded in southeast Asia, their ecological association with ungulates, and some aspects of their occurrence, sale, use and psychoactive effects in selected areas of Thailand (see Fig. 1a, b).

Identification of psychoactive species in southeast Asia

Mycologists have long been aware that certain species of psychoactive fungi occur in some areas



Fig. 1. (a) Map of Thailand.

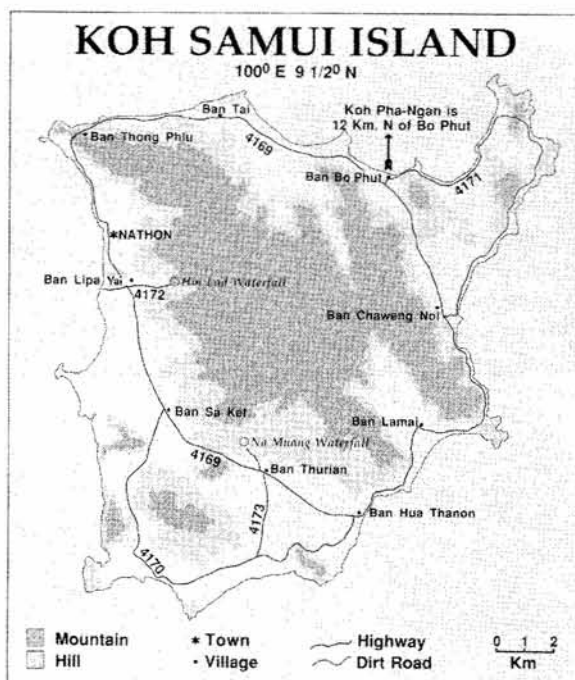


Fig. 1. (b) Koh Samui Island, Thailand.

of southeast Asia. However, during the past 40 years, only a few, brief references in the scientific literature describe the occurrence and consumption of mind-altering fungi in this region of the world (Imazeki and Hongo, 1957, 1969; Singer and Smith, 1958; Emboden, 1972; Pollock, 1976; Anonymous, 1978; Cox, 1981; Schroeder and Guzman 1981). Five species of fungi containing the psychoactive alkaloids psilocybin and psilocin have been reported in various areas of mainland (excluding Japan) and insular southeast Asia (Patouillard, 1907; Ola'h, 1969; Emboden, 1972; Schultes and Hofmann 1973, 1979; Pollock, 1974, 1975, 1976, 1977–78; Guzman, 1983). Recently *Panaeolus papilionaceus* and *Psilocybe semilanceata* have been botanically identified from Pune, India (Bhide et al., 1987) and a form or variety of *C. cyanescens* has been reported from Madras, India (Gerhardt, pers. commun. to T. Stijve, April 8, 1990).

1. *Psilocybe cubensis* (Earle) Singer. 1A. *Psilocybe subcubensis* Guzman

P. cubensis (Earle) Singer, a coprophilous

(dung-inhabiting) species, common in subtropical regions, but unknown in the tropics, was first identified from a specimen collected in Cuba in 1904 as *Stropharia cubensis* (Earle, 1906). About the same time, Patouillard (1907) collected *Naematoloma caerulescens* (which is now synonymous with *P. cubensis*) in Tonkin (Hanoi), North Vietnam. In 1981 (Anonymous), *Head* magazine, an ephemeral publication, published a short pictorial which featured photographs from the island of Bali. The mushrooms macroscopically resembled either *P. cubensis* and or *P. subcubensis*.

Prior to this study, *Psilocybe subcubensis*, a pan-tropical and subtropical species, macroscopically indistinguishable from *Psilocybe cubensis* only by the size of its spores, had only been reported from various regions in Mexico, Central and South America, and Australia (Guzman 1983).

Although *P. cubensis* had briefly been mentioned as occurring in Thailand (Hofmann et al., 1957; Heim and Hofmann, 1958; Picker and Rickards, 1970; Hofmann, 1971; Pollock, 1975) no other observations of this species in southeast Asia have been recorded in the scientific literature until this study. It should be noted that some years ago Schroeder and Guzman (1981) reported the suspected occurrence of either *P. cubensis* and/or *P. subcubensis* Guzman from eastern Nepal. Because of customs regulations, no specimens were forwarded to Guzman for taxonomic study. Guzman therefore had to identify these species using photographs supplied by Schroeder and personal accounts of travelers who ingested the fungi during Schroeder's tour through Nepal.

In the summer and early fall of 1989, the senior author (J.W.A.) observed *Psilocybe* species north of Hat Yai in the Surat Thani province of southern Thailand, and on the islands of Koh Samui and Koh Pha-ngan in the Gulf of Siam (see Fig. 1). In January 1990, J.W.A. also observed and collected specimens of either *P. cubensis* and/or *P. subcubensis* from buffalo dung alongside a mountain trail in the Chiang Dao district of Northern Thailand.

2. *Panaeolus* (Fr.) Quelet and *Copelandia* Bresadola species

The genus *Panaeolus* is divided into three subgenera: *Panaeolina* (Maire), *Copelandia* (Bres.),

Anellaria (Karst), and *Panaeolus* (Fr.) Quel., which are determined by the spores (smooth or verrucose) and cystidia features (see Olah, 1969, 1970). Similar to *P. cubensis* and/or *P. subcubensis*, *Copelandia* species are also dung-inhabiting.

Copelandia species are known to occur in the tropics and neo-tropics of both hemispheres. According to Guzman (1989, pers. commun.), *Copelandia* species are considered to be a subgenus of *Panaeolus*, which includes at least 8 species (Guzman, 1978, 1988, pers. commun.; Weeks et al., 1979). Pollock (1976) had amended this subgenus into sections which were originally separated by Ola'h (1968), who classified *Panaeolus* species into three categories: psilocybian, latent-psilocybian, and non-psilocybian. Although some mycologists refer to the genus *Copelandia*, most prefer *Panaeolus*. According to Guzman, *Panaeolus cyanescens* (Berk. et Br.) Saccardo and *Copelandia cyanescens* (Berk. et Br.) Singer are the same fungi following two distinctly different taxonomic paths (Guzman, 1988, pers. commun.). In southeast Asia, the recreational use of *P. cyanescens* (syn. *C. cyanescens*) has been noted from Java, Bali, and the Philippines (Ola'h, 1970; Emboden, 1972; Schultes and Hofmann, 1973, 1979; Pollock, 1976; Cox 1981; Lincoff, 1987, pers. commun.).

Ola'h (1968) identified three species of *Panaeolus* occurring in various areas of southeast Asia: (1) *P. cyanescens*, (2) *P. tropicalis* Ola'h, and (3) *P. cambodginiensis* Ola'h et Heim. All three of these species are also common in the Hawaiian Islands (Allen and Merlin, 1989), and the latter has been reported from Colombia in South America (Pollock, 1976).

Pollock (1976) also reported *P. tropicalis* as 'fruiting in the dung of cattle and wild animals from Cambodia (Kampuchea)', and, along with Schultes and Hofmann (1973, 1979), Emboden (1979), and Cox (1981), referred to the sale and recreational use of *P. cyanescens* among tourists at festivals and ceremonies on the island of Bali.

While J.W.A. was in Bangkok (1989), several tourists informed him that 'magic mushroom' omelettes (and other foods containing psychoactive fungi) were available in several areas of Thailand, including Krabbi and the islands of

Phuket, Phi-Phi, and Koh Samet. Other travelling informants in Bangkok described similar incidents where they were able to consume 'magic mushroom' omelettes in various areas of Indonesia including Sumatra, Java, and Bali (Mood, 1988; pers. commun. to J.W.A., 1989).

On two separate exploratory excursions into southern Thailand in July and September 1989, J.W.A. collected several specimens (from buffalo dung) of *P. cubensis* and/or *P. subcubensis* and three single specimens of an unidentified species of a bluing *Panaeolus*, section *Copelandia*. On a fourth visit to the island of Koh Samui in January and February 1990, small collections of both *Copelandia* and *Psilocybe* spp. (from cow dung), and *Psilocybe* sp. (from buffalo dung) were collected for herbarium deposit. Additionally, a fifth visit to Koh Samui in July–August 1990 yielded another collection of *Psilocybe* species, which as yet remain unidentified.

Domesticated ruminants and psychoactive fungi in southeast Asia

Although there are approximately equal numbers of domesticated water buffalo and cattle in Thailand, in the southern region, the former greatly outnumber the latter (by 10 to 1). Among the many types of cattle found in Thailand, the most frequently observed is the *Kating* (*Bos guarus*). In the southern province of Surat Thani J.W.A. also observed numerous domesticated *Banteng* (*Bos sundaicus*), which have a distinctive golden yellow colored coat.

The ungulate ancestors of the domesticated cattle in Thailand appear to be *B. sundaicus*, *B. guarus*, and *B. indicus* (Johnson, 1984). All three of these species have some of the characteristics of *B. frontalis*; and *B. indicus*, introduced from India, is perhaps only a domesticated form of *B. frontalis* (Pendleton, 1961; Anonymous, 1980, Anonymous, 1982).

In reference to the coprophilic nature of *Psilocybe cubensis*, McKenna (1988) recently questioned the origin of this psychoactive mushroom, wondering whether it is 'exclusively a creature of the manure of *B. indicus*, or can it occur in the manure of other cattle?' Although *P. cubensis*

often occurs in association with the manure of *B. indicus*, especially after heavy rainfall, Schultes (1988, pers. commun.) indicated that this mushroom species, as well as certain other species of psilocybian fungi, can occur in the manure of other wild ruminants, including species of deer. Guzman (1983) and Watling (1989, pers. commun.) also reported that some species of psilocybian fungi have been found in association with kangaroo feces.

McKenna suggested that the origin of *P. cubensis* can be traced to Kampuchea, but provided very little evidence to support this assertion. He based his assumption on an archaeological excavation in the Non Nak Tha region of Thailand where bones of *B. indicus* have been unearthed in association with human graves dating from around 15,000 years ago (McKenna, 1988).

In January 1990, J.W.A. collected four specimens of *P. cubensis* (and/or *P. subcubensis*) and a few unidentified specimens of *Copelandia*. These specimens were taken from the manure of cattle (*Bos indicus*), known in Thailand as *Wua* (see Fig. 2). J.W.A. observed more than twenty cattle (*Bos indicus* and *B. sundaicus*) at two locations on Koh Samui, and hundreds of water buffalo in various regions of that island.

The genus *Bubalus* contains two subgenera and four species of Asian water buffaloes (Groves, 1969; IUCN, 1972, 1976). The subgenus *Bubalus* includes *B. bubalis* (Asian water buffalo, carabao), distributed from Nepal and India to Vietnam and Malaysia, and *B. mindorensis* (tamaraw), only found on Mindoro Island (Philippines). The subgenus *Anoa* includes *B. depressicornis* (lowland *Anoa*), found in the lowlands of the Celebes, and *B. guarlesi* (mountain *Anoa*) found in the highlands of the Celebes.

The most common water buffalo in Thailand is *B. bubalis* (see Fig. 3), known in Thailand as '*Quai*' (Player 1989). 'There are two varieties in Thailand: one has dark gray skin and hair; the other has pink skin showing through thin blond hair' (Pendleton, 1962). The species is believed to have originated in Nepal and India and today may be found as far east as Vietnam and to the south in Indonesia. Some authors refer to this species as *B. arnee* (Groves, 1969).



Fig. 2. Wua, cattle (*Bos indicus*), along highway 4169, near Ban Saket, Koh Samui.

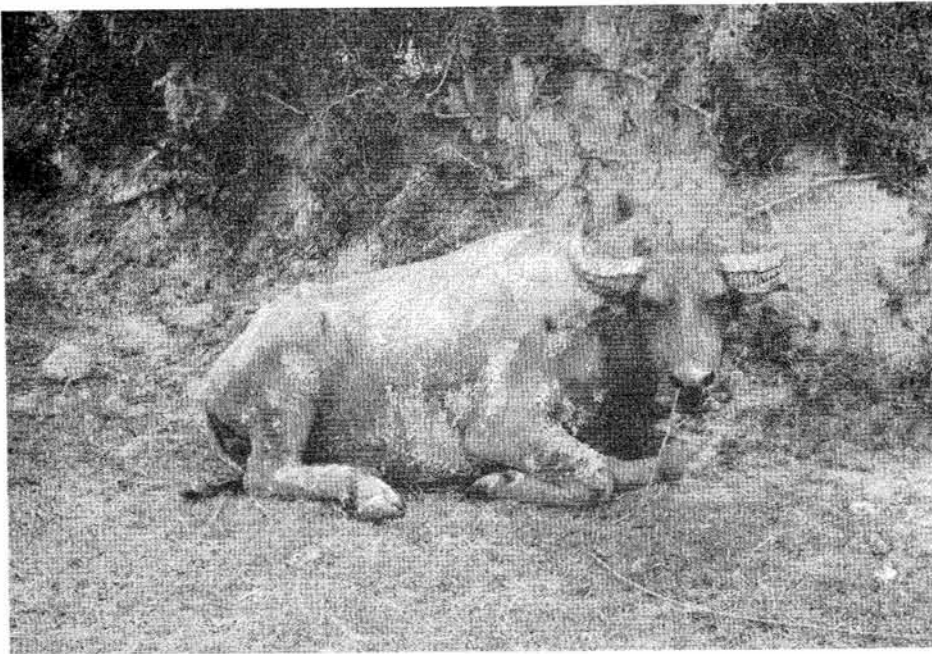


Fig. 3. Quai, or Jao-tooy, Asian water buffalo (*Bubalus bubalis*), Ban Hua Thanon, Koh Samui.

Although the manure of water buffalo (*B. bubalis*) and rice paddies (see Fig. 4) are the primary habitats of psychoactive dung fungi in the southern region of Thailand (the fungi in question can be harvested wherever buffalo may roam). In Surat Thani province, similar dung fungi have also been observed growing in the manure of cattle (*B. sundaicus*) and in the manure of *B. indicus* in one field on Koh Samui. During late Fall and early Spring, while rice production is in progress, the majority of domesticated ruminants on Koh Samui are moved from the rice paddies to mountainous terrain (where Thai native cattle tenders harvest the fungi until the cattle are returned to the fields). The Thai people refer to mushrooms as *hed* and formally call their buffalo *quai*. Thus, the native Thai phrase for 'magic mushroom' *Hed Keequai* can be translated as 'mushroom which appears after water buffalo defecates'. It should be mentioned that J.W.A. also heard the expression '*Hed Keequai*' being used by Thai people in both Bangkok and the northern city of Chiang Mai.

Psychoactive fungi use on Koh Samui and Koh Pha-ngan

In June, 1989, J.W.A. was informed by a foreign college student in Hawaii that 'magic mushroom' omelettes were being served at restaurant resort areas in Thailand, specifically referring to their sale and consumption on the island of Koh Samed in the northern region of the Gulf of Siam (see Fig. 1). Although the authors were not able to visit Koh Samed to investigate this report, J.W.A. did have the opportunity to visit two other islands, Koh Samui and Koh Pha-ngan, located further south in the Gulf of Siam. J.W.A. visited these islands on five separate occasions (July and September of 1989, January–February 1990, and in July–August 1990). The majority of research was done on Koh Samui.

Koh Samui (9½ degrees N latitude and 100 degrees E longitude) is located approximately 710 km south of Bangkok and 25 km off the southern coast of the Thai mainland (see Fig. 1a). It is one

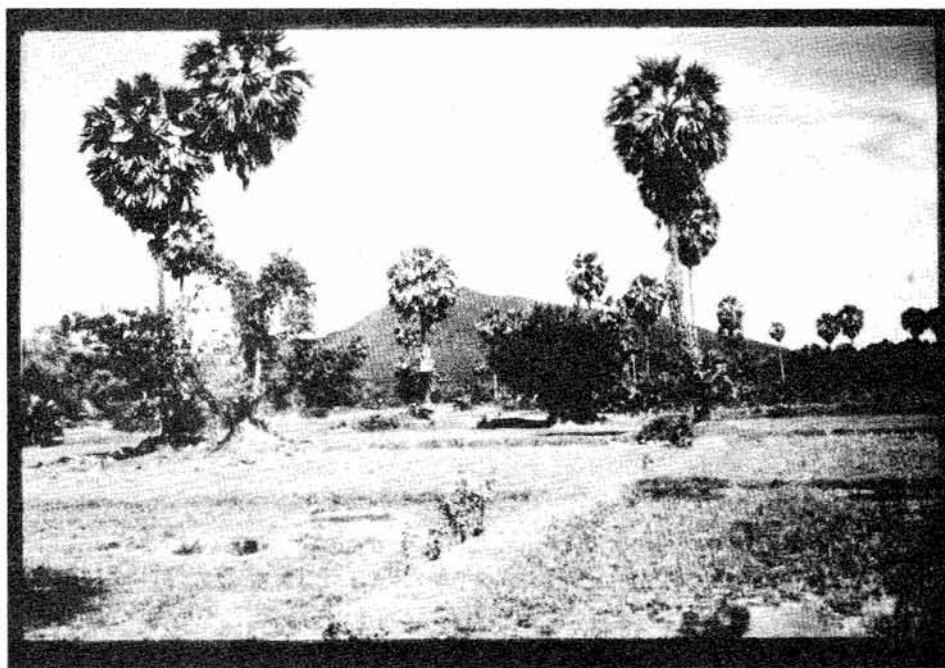


Fig. 4. Rice paddy habitat of *hed keequai*. Ban Hua Thanon, Koh Samui.

of the three main islands in an archipelago comprising 60–80 islands, most of which are relatively small and uninhabited. Koh Samui has a human population of about 35,000. It is the second largest island in Thailand (280 km²), approximately 25 km long, and up to 13 km in width. Mountainous terrain of limestone and granite covers most of Koh Samui, with a maximum elevation of 636 m. Dense vegetation and numerous streams are common. Two water falls (Hin Lad and Na Meung) are located off the main road (Highway 4169) which encircles the entire island and has many side roads leading into the interior.

The more important economic activities on Koh Samui include tourism, fishing, rice cultivation, and extensive copra production. Coconut palms (*Cocos nucifera*) blanket much of the interior from the hillocks right down to the beaches (approximately two million coconuts are shipped each month to Bangkok). The fruits of durian or

thurian (*Durio zibethinus*), rambutan (*Nephelium lappaceum*), langsat or lansa (*Lansium domesticum*), and lamyai or longai (*Euphoria longana*) are also cultivated on Koh Samui.

Temperatures on Koh Samui and Koh Phangan range from 25° to 34°C. Psychoactive fungi appear in abundance during the rainy (monsoon) season which occurs between July and October. However, both *Psilocybe* and *Copelandia* spp. were observed (J.W.A.) being harvested by Thai Samui native people and foreign immigrants as late as February in 1990.

Psychoactive mushroom vendors on Koh Samui

Native cattle tenders as well as those who work or reside in and around the rice paddies are very much aware of the effects and commercial value of *Hed Keequai*. Many of them harvest (see Fig. 5) and sell 'magic mushrooms' (see Figs. 6 and 7) to

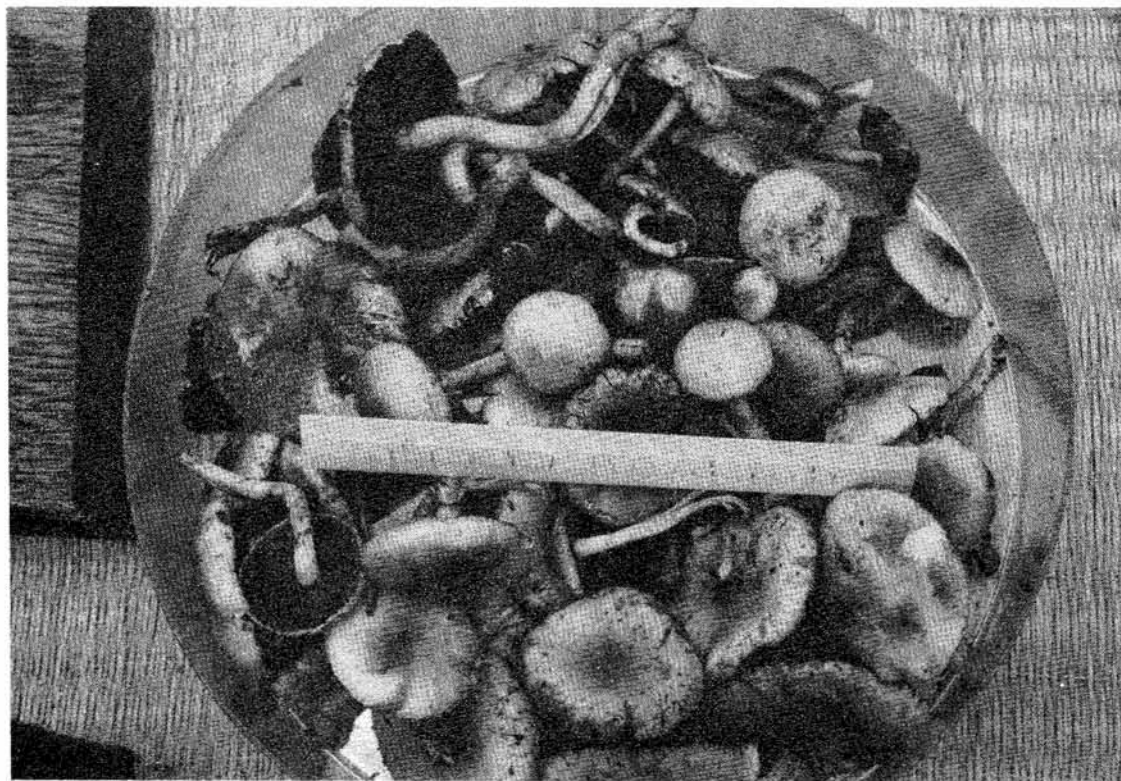


Fig. 5. Psychoactive fungi collected by Samui natives in the early morning near Bo Phut, Koh Samui.

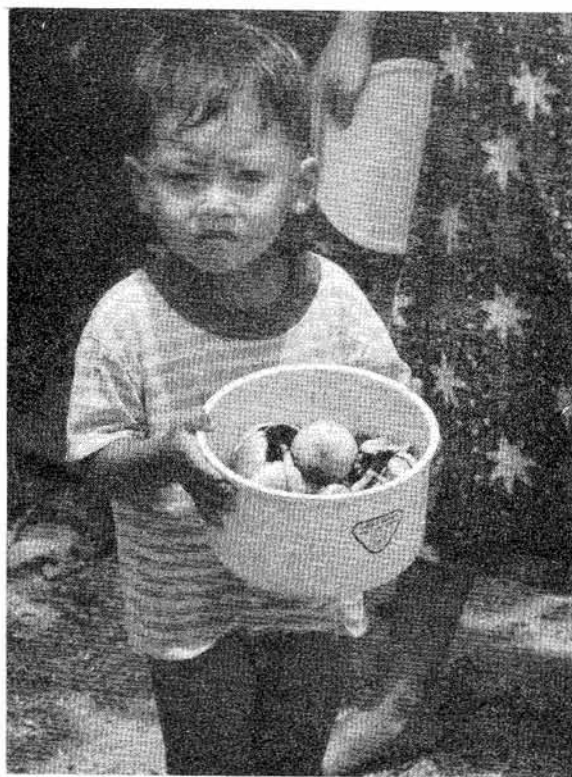


Fig. 6. Young mushroom vendor, Ban Hua Thanon, Koh Samui.

numerous island resort restaurants; some natives also enjoy eating mushroom omelettes (see Fig. 8), and a few (including some children) were observed attempting to smoke *Hed Keequai* in pipes made of bamboo. The habit of smoking 'magic mushrooms' may have been taught to the native peoples of Thailand by foreign tourists who could have read of this alleged practice in the undocumented literary works of anthropologist Carlos Castaneda (cf. Castaneda, 1969; Ott, 1976; Lincoff and Mitchell, 1977; Pollock, 1977-78; DeMille, 1976, 1980). Cox (1981) also reported that this practice is popular amongst some peoples in Samoa. It should be noted that psilocybian fungi are not psychoactive when smoked.

Personal communication with numerous children in the study area on Koh Samui indicated that many in this age group are also well acquainted with *Hed Keequai*; several even offered to collect and/or sell the psychoactive dung-fungi to J.W.A. These children who collect, sell and consume these *Hed Keequai* can readily distinguish the 'magic mushrooms' from other non-psychoactive coprophilous species found in their environment.



Fig. 7. Native of Koh Samui sun drying *Hed Keequai*.



Fig. 8. Native of Koh Samui with *Hed Keequai* and egg.

Similar sales of psychoactive fungi by native children have also been documented from Mexico by Ott (1975) and in Guatemala by Lowy (1977).

In December 1988, a Thai law was passed proscribing psychoactive fungi as prohibited plants. However, many 'bungalow resorts' on Koh Samui still serve 'magic mushrooms' in one form or another, if ordered by their customers (before January 1989, many of the more than 200 resorts on Koh Samui and Koh Pha-ngan used billboard signs to indicate that 'magic mushrooms' were available in their establishments). Some resorts also continue to offer 'magic mushrooms' in omelettes, soups, stews and pizzas, as well as in teas and liquefied beverages. One resort restaurant was also observed serving 'magic mushroom' herb cookies which contained 'ganja' (*Cannabis*) mixed with *Hed Keequai* (cf. Cummings, 1981).

Although restaurants at various resorts on Koh Samui and Koh Pha-ngan offered a fixed price of 100 Baht (\$4.00 U.S.) for a mushroom omelette, the cost varies from 50 to 200 Baht at other commercial bungalow dining places. Koh Samui children harvest and sell fresh *Hed Keequai* to tourists for 100 Baht per ounce or less. Adults may charge anywhere from 100–300 Baht per ounce depending on the season and availability of the fungi. Observations in several Koh Samui homes situated alongside the many rice paddies located throughout Koh Samui, indicated that large food scales are used for weighing the psychoactive mushrooms for sale. Young children and male adults allowed photographs to be taken of them with their mushrooms. The women of Koh Samui, on the other hand, refused to allow such photographs, expressing a fear of police and being arrested because of their association with the fungi (they indicated this by crossing their arms at the wrist as if they had been handcuffed).

A few waiters at 'Munchies' resort and several other resorts on Koh Samui and Koh Pha-ngan asked the senior author where they might also collect specimens of *Hed Keequai* for their establishments.

Psilocybian mushrooms or LSD adulterated omelettes?

In the fall of 1988 tourist police on Koh Samui and Koh Pha-ngan circulated printed sheets of paper (flyers) to all bungalow resorts. These issued a warning that mind-altering mushrooms ('*Hed Keequai*') were dangerous ('*antaray*') and made people crazy ('*ae tam hai ben baa*'). The flyers also noted that these fungi were illegal. An official 'tourist police officer' interviewed in the village of Ban Nathon reported that a young Austrian tourist experienced a dysphoric reaction after ingesting a large quantity of psychoactive fungi consumed in a 'magic mushroom' tea. According to the police officer, this young man, in his early twenties, manifested extremely bizarre behavior as a result of his intoxication and was consequently committed to a mental institution by a Thai judge. He remained in the institution for four months before being released. As a result of this incident,

and a few similar, but less serious, events, the Thai government banned the use of *Hed Keequai* in Thailand.

A somewhat different, more descriptive and interpretive analysis of this incident was also offered to J.W.A. by a German immigrant who had worked at one of the many 'magic mushroom' farms that no longer operate openly on Koh Samui. According to this informant, in 1988 the young foreign tourist, while celebrating his birthday over a three-day period, ingested *Cannabis*, opium and psilocybin mushrooms, while continuously consuming alcohol. On his birthday, he allegedly brewed and consumed a psychoactive mushroom tea utilizing over two pounds of fresh *Hed Keequai*. In addition, he allegedly ingested heroin, along with the other psychoactive substances. Because of his subsequent anti-social behavior the tourist was indeed institutionalized for a period of 4 months by a Thai magistrate. Upon his release, the youth was described as coherent only briefly, and more often acted '... looney as a bird'.

Because of the above mentioned incident, the numerous signs advertising 'magic mushrooms' were removed from in front of the various resorts along highway 4169, and a majority of the restaurants on Koh Samui and Koh Pha-ngan also removed 'magic mushroom' omelettes from their menus. In July 1989 J.W.A. obtained a menu from 'Munchies' resort (see Fig. 9); and as recently as December 1989, J.W.A. obtained a menu from a new resort on the island of Koh Pha-ngan (see Fig. 10). Both menus listed 'magic mushrooms' as edible items for sale.

At 'Munchies' resort in Hat Chaweng, Koh Samui, which provides business cards portraying mushrooms, J.W.A. and his Scottish travelling companion bought and consumed a 'magic mushroom' omelette. The effects and symptoms produced by this omelette lasted for almost 10 h, much longer than the normal duration of a psilocybin mind-altering experience. This single experience caused the Scottish traveller some minor psychological distress which lasted for at

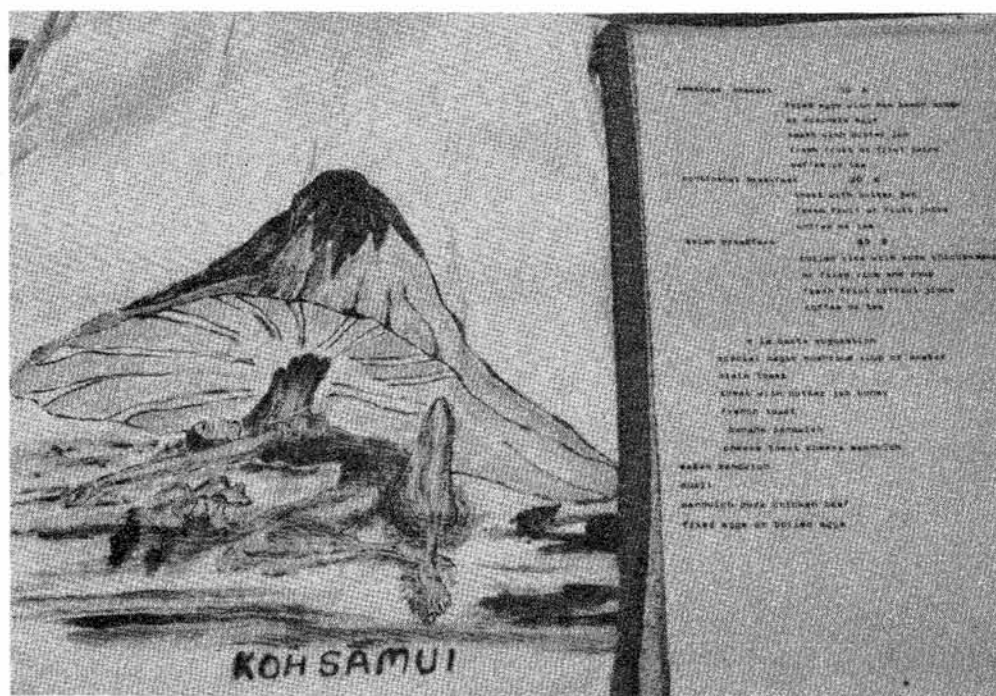


Fig. 9. T-shirt and menu from 'Munchies' Resort, Hat Chaweng, Koh Samui.

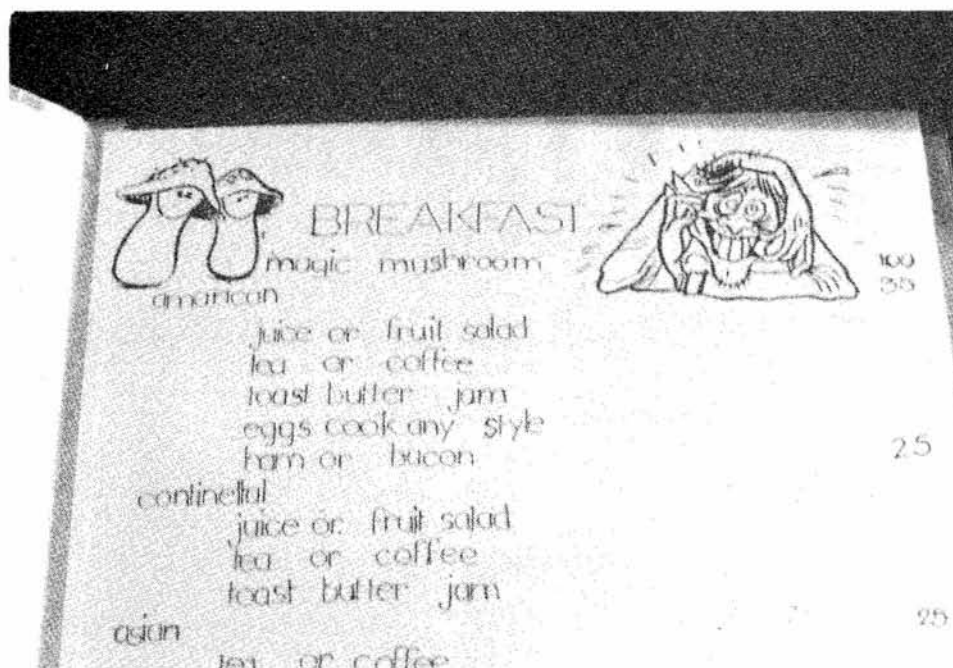


Fig. 10 New menu from Palm Beach Resort, West Hat Rin Beach, Koh Pah-ngan.

least 2 months; in a private communication (1989), he stated that since returning to his home in Glasgow he was still hesitant to eat any omelette containing mushrooms.

The local native waiters who served the omelette at Munchies resort, referred to the mushrooms in the omelette simply as 'magic'. The manager of the restaurant claimed that the cook was the only person who knew what had been put into the omelette. Attempts to dry and preserve the omelette for laboratory study proved futile. During the second excursion of J.W.A. to Koh Samui (September 1989), another omelette was ordered which actually contained *Psilocybe* mushrooms (see Figs. 11 and 12).

Observations and personal interviews (July 1989) with restaurant and bungalow managers at resort restaurants on Koh Samui indicate that 27 serve omelettes containing psilocybin mushrooms and three which admitted serving omelettes containing a more powerful synthetic or semi-synthetic hallucinogen ('LSD'). When the mushrooms are in season they are available to the restaurants; however, a supply of LSD has ap-

parently been made available to restaurants at several resorts.

One of the present authors (J.W.A.) observed a few German immigrants posting dried 'Hed Kee-quai' to friends in Germany. These immigrants were not aware of naturally occurring psychoactive fungi in their country nor were they aware of the LSD adulterated fungi sold in their homeland.

Stahl et al. (1978) were the first to report the sale in Germany of *Shitake* LSD adulterated fungi. These fungi were from southeast Asia. Similar fungi, adulterated with LSD and PCP, (*Agaricus campestris* and/or *A. bisporis*) have been available for sale in the United States since the late 1960s (Ott, 1976, 1978). Stijve (pers. commun., 1989) also reported that these adulterated fungi are still being sold on the German illicit drug market.

A female informant from Sweden, who observed the senior author's consumption of the hallucinogenic omelette (possibly laced with LSD), claimed that she had observed two people who had experienced a 2-day dysphoric experience after consuming a 'magic mushroom' omelette at another resort ('Big Buddha') in the northeast

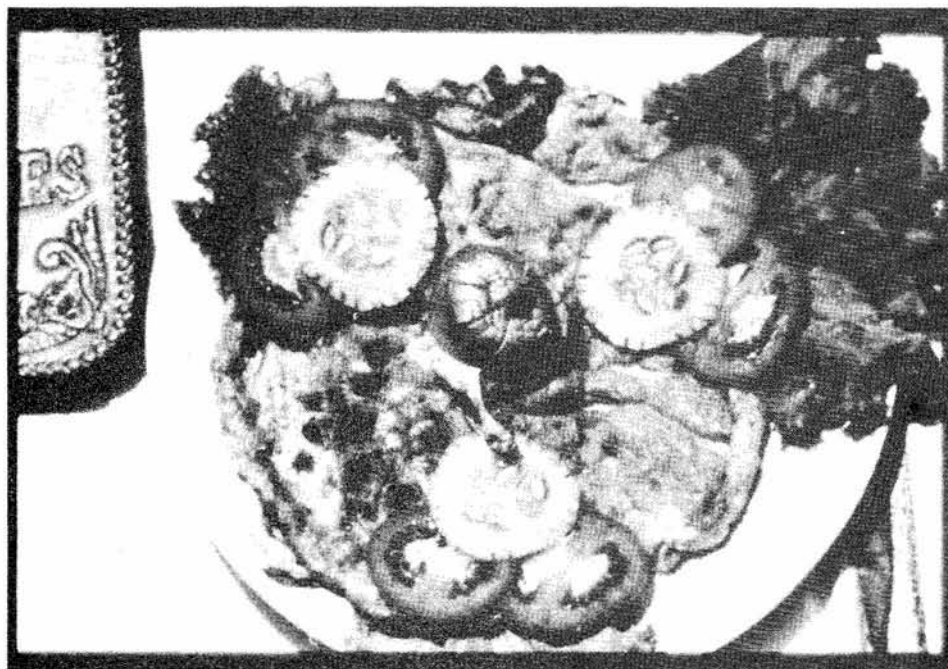


Fig. 11. A deluxe 'magic mushroom' omelette from 'Munchies Resort', Koh Samui.



Fig. 12. Omelette, menu and T-shirt from 'Munchies' Resort, Koh Samui.

region of Koh Samui. Other tourists also reported observing similar dysphoric reactions elsewhere in Koh Samui.

Mushrooms in publications catering to tourist influence

Evidence regarding the use of psychoactive fungi has also been reported in several foreign, tourist-oriented, guide books and travel magazines. For example, a publication entitled '*Guide to Southern Thailand, Phuket, Koh Samui*' reported the following: 'On Koh Samui, the island food matches the good company. Worth mentioning are the hallucinogenic mushrooms that are listed on the menu as "Magic Mushroom Omelettes". This psychedelic fungi causes headaches, mental distortion, and the feeling of being electric. If mistakenly eaten, the drugged side effects will wear off in 24 h' (Anonymous, 1989). According to a German guide book, tourist police first began the distribution of pamphlets issuing warnings about the dangers of ingesting magic mushroom omelettes as early as 1986; this guidebook also provides a brief history of psilocybin and describes its popularity amongst tourists on Koh Samui (Mobius and Ster, 1987). Another guide book (in English) reports that the 'Peace' bungalow resort in Hat Bo Phut, Koh Samui, offers the biggest 'magic mushrooms' ever seen (Cummings, 1987).

Saen Sanuk, a popular, Thai Travel magazine provided the following warning and anecdotes regarding the recreational use of *Hed Keequai* on Koh Samui 'Magic mushrooms, an extraordinary species of mushroom which grows out of buffalo dung on Koh Samui and a favorite among foreign tourists, are also problem makers. The mushrooms which many restaurants and bungalows offer in their menus cause acute hallucination for consumers and such effects can be physically dangerous as well. [In the published literature on the subject of human ingestion of psilocybin mushrooms, there is no evidence to suggest that these fungi are physically toxic]. One foreign student whirled his motorbike onto a muddy roadside field after eating food cooked with the mushrooms. Another stripped all his clothes in public and went furiously hilarious' (Angsanakul, 1987).

This same article also warned that several people '... had to have their stomachs pumped at the island hospital'. The above mentioned incident referring to bizarre, naked behavior is similar to one which occurred in Oaxaca, Mexico in the, 1960's, where an unclothed 'beat' ran through the streets causing a most disturbing and distressing experience for the local native peoples (Finkelshtein, 1969). This single incident in Mexico played a significant role in the eventual expulsion of thousands of foreign young people from that country (Anonymous, 1970; Ott, 1975; Pollock 1977-78). A similar incident also occurred in Australia when a respectable family man ran naked through the halls of a hospital 'trying to molest the nurses who were attempting to treat his illness' (McCarthy, 1971; Allen et al., 1991).

In the summer of 1988, *High Times Magazine* published a five-page exploitative pictorial entitled as 'Koh Samui, Sex and Drugs in Thailand'. One paragraph in this article was devoted to 'magic mushroom omelettes' accompanied by two photographs of what macroscopically appear to be *P. cubensis* and/or *P. subcubensis* and a photograph of a sign advertising a 'Magic Mushroom Farm' (Eder, 1988).

In February 1991, *Islands*, an international travel magazine mentioned 'at night bleary-eyed blonds with silly smiles recline on cushions around a low table, munching "special mushroom" omelettes and looking at one another dreamily' (Iyer, 1991).

Psychoactive mushroom farms

In July 1989, J.W.A. attempted to visit a 'magic mushroom' farm in Bo Phut. The 'farm' included several rice paddies which had been used by both Samui natives and German immigrants for the propagation of *Hed Keequai*. Native cattle-tenders and foreign immigrants collect and transport manure piles containing *Hed Keequai* to the rice paddies where they arrange them in rows. Fresh manure is added to the paddies and harvest takes place after the fungi appear.

An anonymous farmer (pers. commun., September 1989) confided to J.W.A. that although there were a lot of water buffalo on Koh Pha-ngan (an island north of Koh Samui, population 6000)

no one had ever found 'magic mushrooms' growing there. This informant claimed that he sold 'magic mushrooms' to many restaurants on both Koh Samui and Koh Pha-ngan islands. In December of 1989, the manager of the 'Bongo Bar' on the island of Koh Pha-ngan was interviewed; he claimed that he picked *Hed Keequai* across the trail from his bar. He substantiated this by showing J.W.A. the open field where he collected his supply of *Hed Keequai*.

At the time when the mushrooms were not considered illegal, there were numerous 'magic mushroom farms' situated throughout the two islands. Some of these commercial establishments were indoor operations. Several anonymous sources in Koh Samui and others on Koh Pha-ngan reported that a few 'farms' remained in existence, but under rigid secrecy near the small village hamlet of Ban Saket and in the mountain regions of Koh Samui.

Other commercial activities related to psychoactive mushroom use

As in Mexico, where native peoples have greatly profited from the sale of mushroom-related items (Ott, 1975; Pollock, 1977-78), local artists and crafts-people in Thailand also market hand painted 'magic mushroom' T-shirts, embroidered dress shirts, and postcards depicting what are purported to be 'magic mushrooms'. During the week of September 8-14, 1989, J.W.A. observed more than thirty different, hand-painted T-shirts for sale in Thailand (see Fig. 13) which had hand-painted drawings of what appear to be 'magic mushrooms'. These garments were offered for sale in various shops throughout Koh Samui. On Koh Pha-ngan, a 'magic mushroom' T-shirt displayed both *Psilocybe* and *Copelandia* species (see Fig. 14). Several postcards (12 different) depicting 'magic mushrooms' were also observed on Koh Samui, Bangkok, and in Chiang Mai (see Fig. 15). Similar hand painted shirts copied from some of these postcards were observed in the Banglum Poo district in Bangkok.

In January 1990 the senior author observed more than twenty new hand-painted T-shirts depicting 'magic mushrooms' from Koh Samui.



Fig. 13. T-shirt from Koh Samui with *Psilocybe cubensis* motif.

Framed posters (copied from mushroom postcards) were now available, as were similar factory produced (machine printed) T-shirts. These same T-shirts were also available in Bangkok. In the northern Thailand city of Chiang Mai, motifs showing 'magic mushrooms' adorn boxes, cigarette lighters, pencil holders and key chains; and printed 'magic mushroom' T-shirts were also common at the Chiang Mai 'night market' (see Allen, 1991).

Locations of psychoactive fungi collected on Koh Samui

Three species of psychoactive fungi have been identified from Thailand; two belonging to the genus *Psilocybe* and one belonging to *Panaeolus*,



Fig. 14. T-shirt portraying *Psilocybe* and *Copelandia* sp. with 'magic mushroom' omelette, West Hat Rin Beach, Koh Pha-ngan.

sub-genus *Copelandia*, were observed in situ, photographed, and collected for herbarium deposit. These three species were observed in and/or collected from eight different locations throughout the island of Koh Samui including: Ban Hua Thanon, Bo Phut, Hat Chaweng (directly across the road from 'Munchies' resort), Ban Tai (three fields), Ban Lipa Yai, Ban Thong, Ban Thurian, and 6 km north of Ban Hua Thanon near the village of Ban Saket. Most collection sites are situated along both sides of highway 4169 near Hat Chaweng and Ban Lamai, and three fields near Ban Saket along highway 4170. *Copelandia* species were observed and collected from three locations near Ban Hua Thanon, Ban Lipa Yai, and Ban Saket.

Species collected for herbarium deposit

Fungi specimens (from *B. bubalis* dung) collected on Koh Samui between July 25–30, 1989, included two unidentified specimens of *Copelandia* and a collection of either *P. cubensis* and/or *P. subcubensis* (see Fig. 16). They have been deposited at the Bernice P. Bishop Museum Herbarium in Honolulu, Hawaii. These specimens were collected at sea level near the village of Ban Hua Thanon.

Fungi specimens (from *B. bubalis* dung) collected on Koh Samui between September 8–14, 1989 included one bluing specimen of a *Copelandia* species (see Fig. 17) and a collection of *P. subcubensis* (see Figs. 18–20). The *Copelandia* specimen was collected in the fields at Ban Lipa Yai, 2 km south of the port village of Ban Nathon and forwarded for study to Dr. Don Hemmis, biologist at the University of Hawaii at Hilo. Dr. Hemmis (pers. commun., 1989) has since examined the specimen and indicated that the spores are relatively small, measuring in size from $10\text{--}14 \times 5\text{--}6 \mu\text{m}$, ovate with germ pore. This specimen (collected in September 1989) and the two other *Copelandia* specimens (collected in July 1989), all exhibited intense bluing in the stem after handling.

The *Psilocybe* specimens were collected in the rice paddy fields from partially decomposed buffalo manure near Ban Hua Thanon and Ban Tai and were forwarded to Dr. Gaston Guzman at the Instituto de Ecologia in Xalapa, Veracruz, Mexico. Dr. Guzman identified them as *P. subcubensis*. This is the first report of *Psilocybe subcubensis* from Thailand. Guzman also identified *Panaeolus campanulatus* from Koh Samui.

Fungi specimens collected between January 24 and February 1, 1990 include the following: (see Table 1).

(A) January 28, 1990. One small *Psilocybe* identified by Villinga as *P. subcubensis*, and two small specimens of a *Copelandia* species, identified by Gerhardt as a var. or fm. of *C. cyanesceus* (see Fig. 21) were collected. Stijve (pers. commun., 1990) noted the discovery of a new indole compound in this Thailand collection of *Psilocybe* fungi.

(B) January 29, 1990. Three unidentified species of *Agaricus* (possibly *A. arvensis*), three small specimens of *Psilocybe* identified as *P. cubensis*

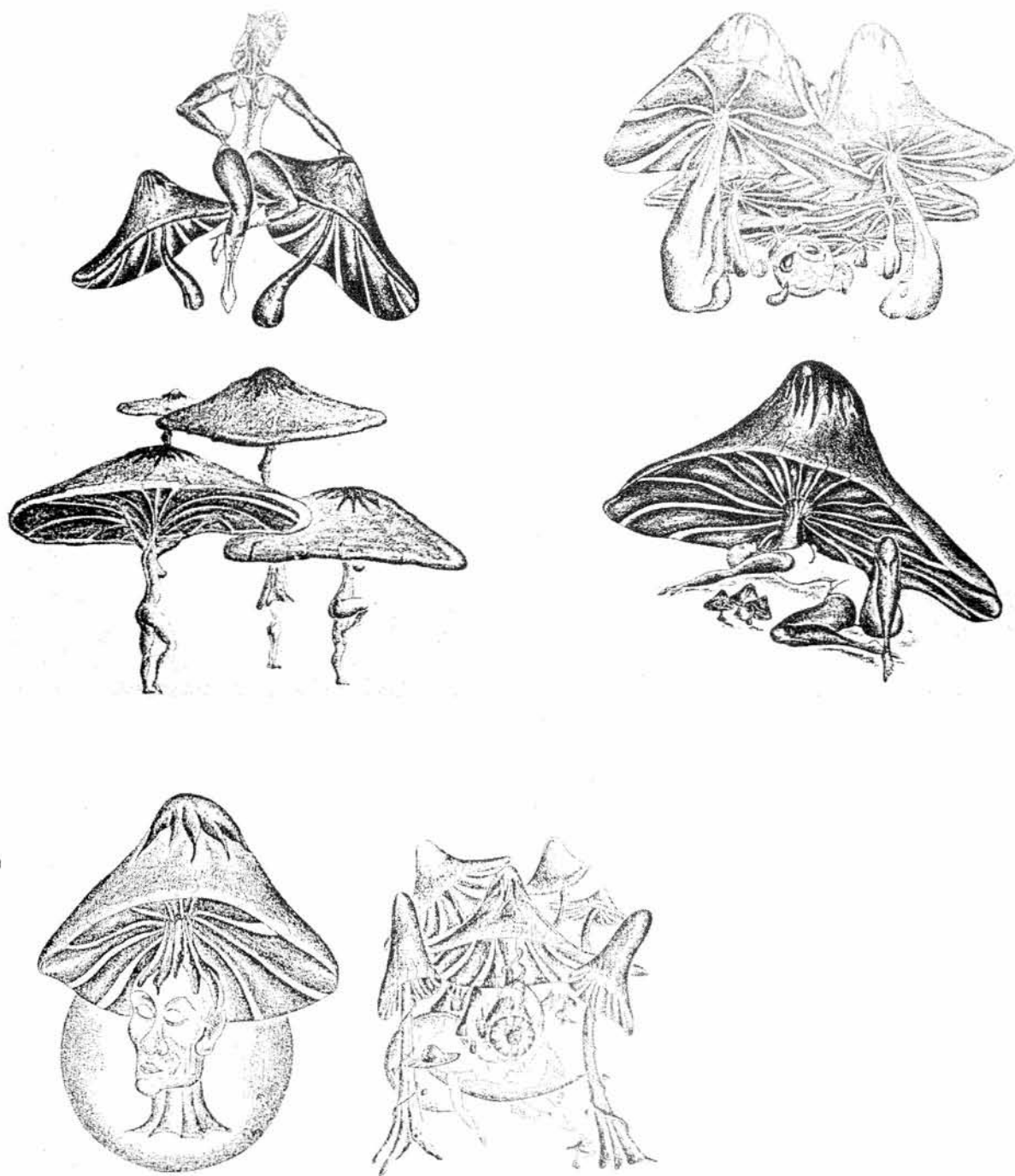


Fig. 15. Mushroom motif on postcards, posters and T-shirts sold throughout Thailand.



Fig. 16. Freshly harvested specimens of *Psilocybe* sp., Ban Hua Thanon, Koh Samui.

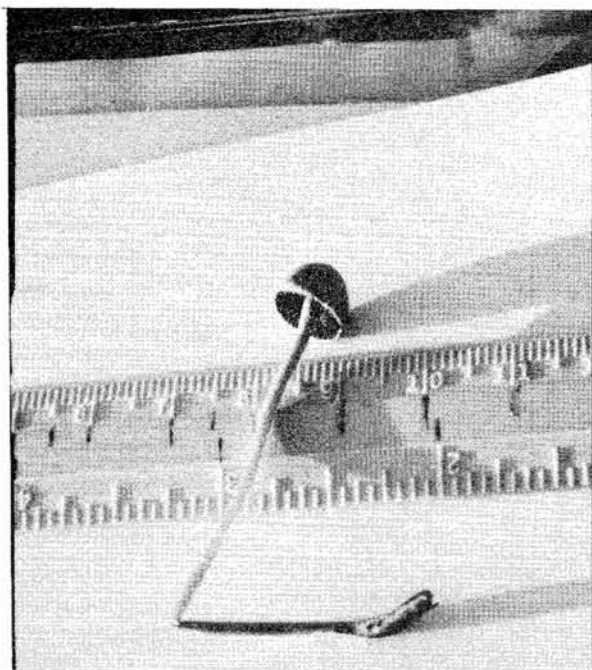


Fig. 17. Unidentified specimen of *Copelandia*, Ban Lipa Yai, Koh Samui.

and a small collection of *Copelandia* species identified by Gerhardt as a var. or fm. of *C. cyanescens* (see Fig. 22) were also collected.

(C) A small collection of *P. cubensis* was harvested from buffalo (*B. bubalis*) dung on January 31, 1990 along a mountain trail at 350 m elevation above Nathon. Also a small collection of *Panaeolus antillarum* was collected from the fields of Ban Hua Thanon.

(D) A small collection of *P. cubensis* was also obtained from buffalo (*B. bubalis*) dung harvested alongside rice paddies near Ban Hua Thanon on January 26, 1990.

(E) A small collection of *P. subcubensis* was harvested on January 4, 1990 from buffalo (*B. bubalis*) dung along a mountain trail at 650 m elevation near Chiang Dao in Northern Thailand. Collection E was identified in Leiden, Netherlands by Villinga as *P. subcubensis* (Stijve, pers. commun., 1990).

Collections A and B were obtained from cattle (*B. indicus*) in a fenced pasture among palm trees

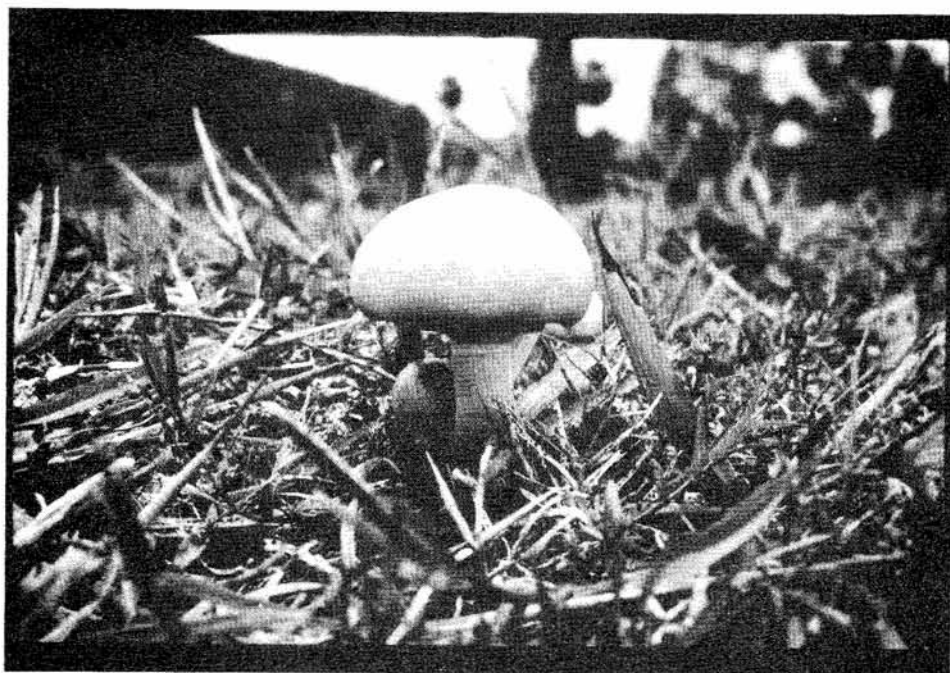


Fig. 18. Fresh *Psilocybe subcubensis*, Ban Hua Thanon, Koh Samui.

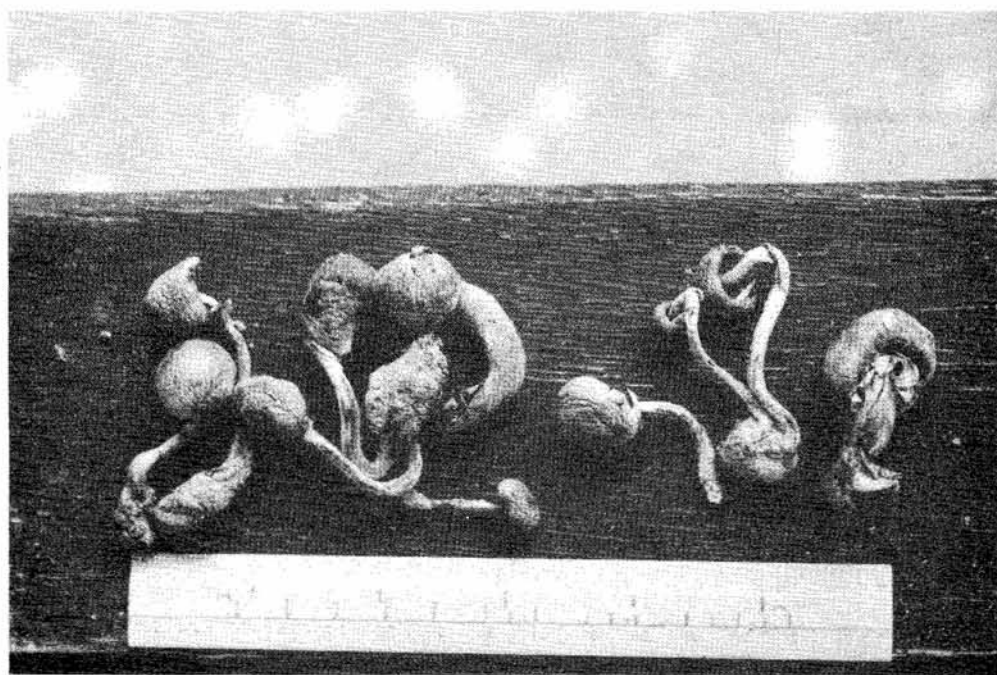


Fig. 19. Dried *Psilocybe subcubensis*, Ban Hua Thanon, Koh Samui.

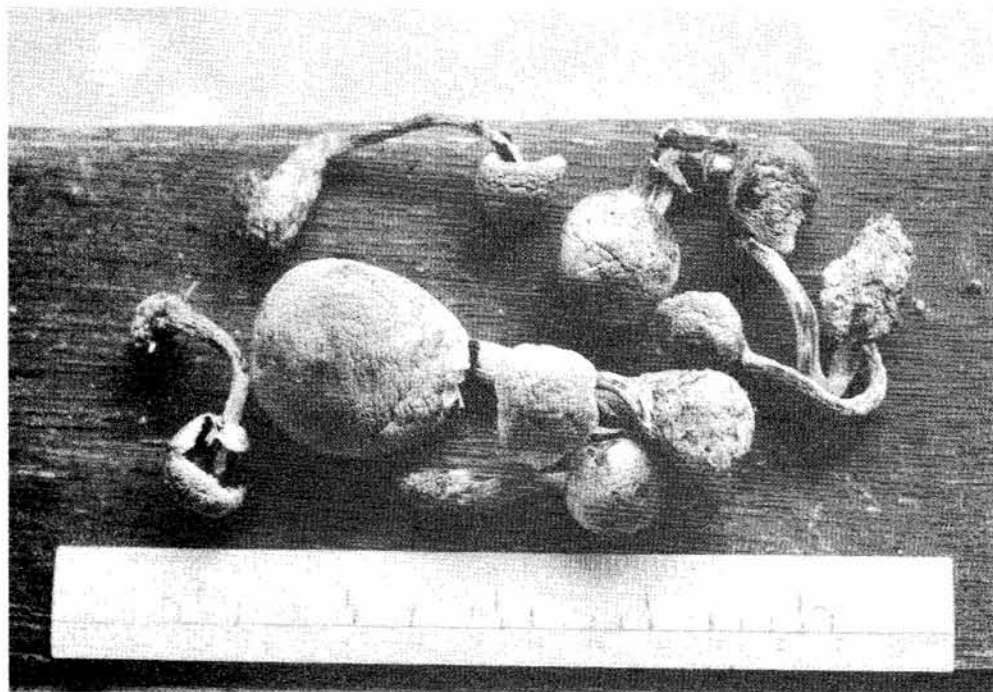


Fig. 20. Dried *Psilocybe subcubensis*, Ban Hua Thanon, Koh Samui.

(*C. nucifera*) 6 km north of Ban Hua Thanon, alongside highway 4169 near the village of Ban Saket.

The single *Psilocybe* in collection A was identified by Villinga as *P. subcubensis* Guzman. Spores measured $12\text{--}15 \times 8\text{--}12 \mu\text{m}$. Pleurocystidia present $13\text{--}20 \times 9\text{--}13 \mu\text{m}$. Cheilocystidia present $15\text{--}30 \times 6\text{--}9 \mu\text{m}$.

The *Copelandia* specimens in collections A and B were recognized by Gerhardt in Berlin as a variety of form of *Panaeolus (Copelandia) cyanescens* Berkeley et Broome. The spores measured $13 \times 9.5 \mu\text{m}$ and the pleurocystidia and cheilocystidia were both present. According to Gerhardt (Stijve, pers. commun., 1990) there are small microscopical differences in the color of the metuloids which are more or less green at the tips. Gerhardt (pers. commun. to Stijve, 1990) examined similar specimens of *Copelandia* species from Madras, India, and concluded that the collections from Koh Samui, Thailand were a var. or fm. of *C. cyanescens*.

The *Copelandia* specimens in Collections A and B have relatively high percentages of psilocin, but no psilocybin is present (see Fig. 23). Although collections of *Copelandia* from Queensland, Australia, also had large amounts of psilocin but were virtually absent in psilocybin, collections of specimens from Hawaii, examined for comparative analysis, possess large amounts of both psilocin and psilocybin (see Fig. 24). For the TLC and HPLC methods of analysis see Stijve et al. (1984).

Collections A—E were forwarded for study to Dr. T. Stijve of Nestec Ltd., Vevey, Switzerland. In a preliminary report, Dr. Stijve indicated that collection A displayed a large concentration of various tryptamine alkaloids (pers. commun., 1990).

A fifth collection of psychoactive dung fungi (collected August 12, 1990) was forwarded to Guzman for botanical identification. No results of analyses have been received yet.

Additionally, a sixth collection (collected August 2—12, 1991) included several collections

TABLE I
RESULTS OF CHEMICAL ANALYSES OF FUNGI COLLECTED FROM KOH SAMUI, THAILAND
Analyses done by T. Stijve, Vevey, Switzerland, all values expressed in percentage of dry weight

Collection	Origin	Botanical identity	Psilocin	Psilocybin	Baeocystin	Tryptophan	Urea	Serotonin	Tryptamin
<i>Psilocybe</i> A	Koh Samui near Ban Saket January 28, 1990.	<i>P. subcubensis</i>	0.26	0.37	0.006	0.01	<0.02	—	—
<i>Copelandia</i> A	Koh Samui near Ban Saket January 28, 1990.	<i>Panaeolus</i> (<i>Copelandia</i>) <i>cyanescens</i>	0.40	<0.025	<0.025	<0.02	3.3	0.033	0.008
<i>Psilocybe</i> B	Koh Samui near Ban Saket January 29, 1990.	<i>P. cubensis</i>	0.58	0.042	<0.01	0.007	0.03	—	0.003
<i>Copelandia</i> B	Koh Samui near Ban Saket January 29, 1990.	<i>Panaeolus</i> (<i>Copelandia</i>) <i>cyanescens</i>	1.05	<0.025	<0.025	<0.02	2.0	0.026	0.002
<i>Psilocybe</i> C	Koh Samui, along foot trail at 350 m.a.s.l. January 31, 1990.	<i>P. cubensis</i>	0.19	0.08	<0.01	0.02	0.02	—	<0.002
<i>Panaeolus</i> <i>antillarum</i>	Koh Samui from Ban Hua Thanon January 31, 1990	<i>Panaeolus</i> <i>antillarum</i>	<0.01	<0.01	<0.01	0.035	2.8	0.015	<0.002
<i>Psilocybe</i> D	Koh Samui near Ban Hua Thanon January 26, 1990	<i>P. cubensis</i>	0.20	0.08	<0.01	0.01	<0.02	—	0.002

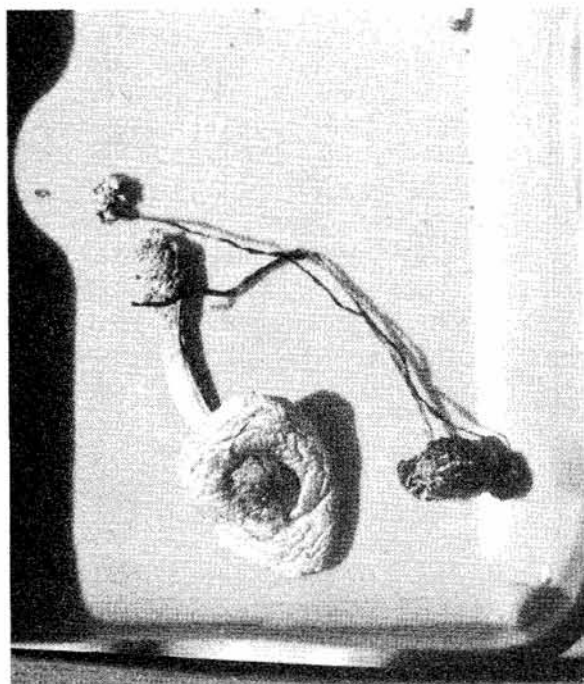


Fig. 21. Collection A. (1) *Psilocybe* and (2) *Copelandia* specimens.

of *Psilocybe* and *Copelandia* species from Ban Hua Thanon, Ban Bo Phu, Ban Lipa Yai, Koh Samui, including a new variety of *Psilocybe* macroscopically resembling *P. semilanceata*. A preliminary report from Stijve (pers. commun., 1991) indicates that it is a very potent species with high concentrations of both psilocin and psilocybin.

Acknowledgments

The authors of this study wish to thank the following people for their assistance in the preparation of this paper: Mr. Sawat, Mr. Toowey, Mr. Jak, Mr. Ahka, Mr. Mungalow and Mr. Rin of Ban Hua Thanon; and Mr. N. L. of Bo Phut, Koh Samui, Thailand for placing their trust in the senior author and allowing him into their homes and for the privilege of taking their photographs; and Dr. Prakitsin Sihanonth, Head of the Department of Microbiology, Chulalongkorn University, Bangkok, Thailand; Mr. Paul Risi, Norwell, MA and Mr. Steve Hager,

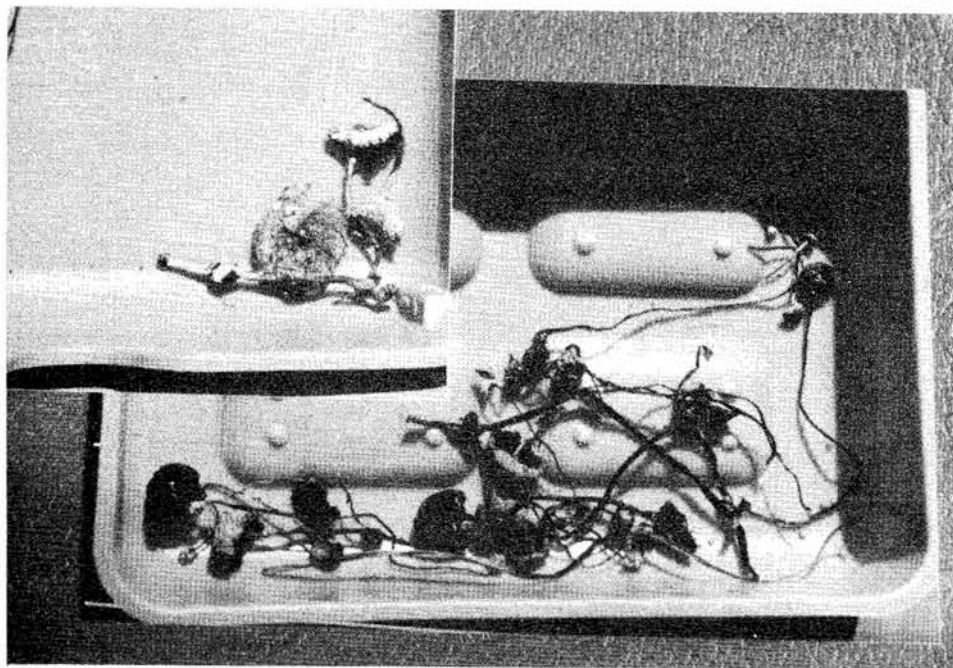


Fig. 22. Collection B. (3) *Psilocybe* (insert upper left) and a small collection of dried *Copelandia* species from cow manure in area near Ban Saket, Koh Samui.

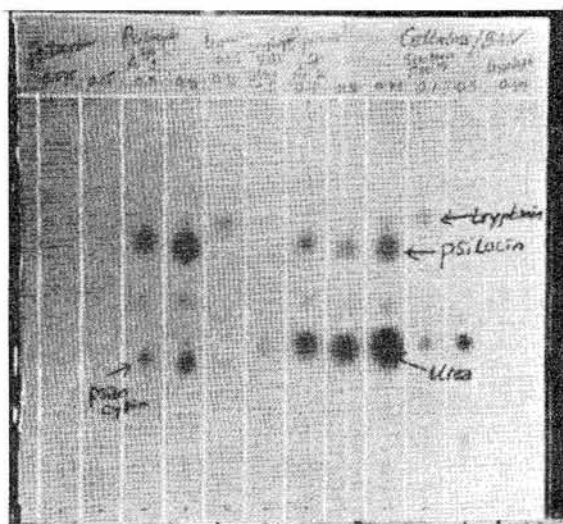


Fig. 23. TLC of *Psilocybe* and *Copelandia* collections.

Trans High Corporation, New York, for information pertaining to location sites in Thailand; Dr. Stanley Krippner, Saybrook Institute, San Francisco; Dr. T. Stijve, Vevey, Switzerland, for his invaluable aid on the chemical analysis of the Thailand collections. Dr. E. Salzman for his encouraging words; Dr. Don Hemmis, University of Hawaii, Hilo, for his examination of the *Copelandia* specimens collected between September 8–14,

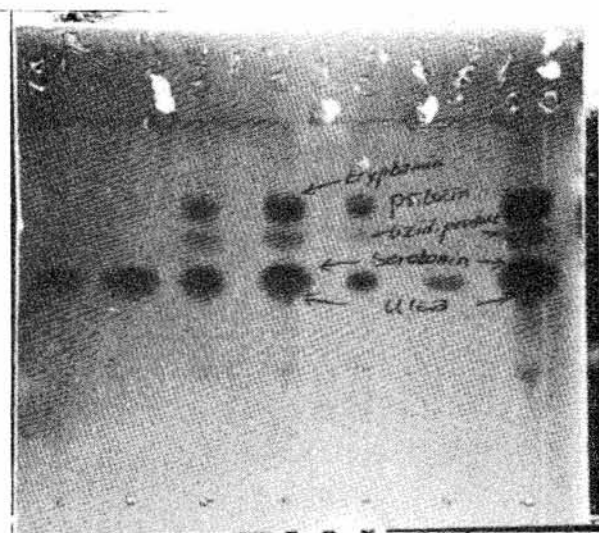


Fig. 24. Analysis of *Copelandia* collections of another system.

1989; Dr. Gaston Guzman for his identification of *P. subcubensis* collected between September 8–14, 1989; Dr. Ewald Gerhardt, Berlin, Germany, and Else Villinga, Leiden, Netherlands, for their identification of species collected in January–February, 1990. A special note of appreciation and gratitude to Mr. Nigel Graham of Glasgow, Scotland, and Frank G. Heidrich and Brigitte Immler of Berlin, Germany for assisting the senior author while conducting field research on Koh Samui, and a special thanks to Dr. Richard Evans Schultes of the Harvard Botanical Museum for his time in reviewing this paper.

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