The study of contemporary algae consumption in several islands of the Marquesas and Austral archipelagoes documents a little-known practice in French Polynesia. It provides information about some aspects of ancient Polynesian diet. It is, we will argue, a survival. This poses intriguing comparative questions both for other islands of French Polynesia and for Hawai‘i, especially in the historical as well as pre-European periods.

In an earlier article (Conte and Payri 2002), we discussed initial findings regarding consumption of edible algae from a survey conducted mainly in Ua Huka Island in the Marquesas, French Polynesia (Fig. 1). In the conclusion we emphasised the need to continue ethnographic data collection of algae consumption, an ever-dwindling practice, before such information becomes too scant or the practice died out altogether. To ensure this did not remain simply wishful thinking, we have continued conducting surveys alone or with the help of collaborators in several French Polynesian islands where algae are still eaten.

The consumption of algae has not been well documented in the region that we have studied, neither for recent nor pre-contact times. The absence of accounts on this subject by the first Europeans makes it difficult to judge whether this practice was more developed in times past than today, although this is a possibility. However, the level of consumption of algae would never have reached the same importance in French Polynesia that it did in other Polynesian archipelagos such as Hawai‘i, where it is still high.

Survey Setting and Data Analysis

Following Conte’s study of the Marquesan island of Ua Huka in August 1999, two successive surveys were conducted in Nuku Hiva Island: in April/May 2002 by Solange Sidolle, and in September/October 2003 by four Year-14 students from the Taiohae secondary school under the supervision of Ghislaine Mirale. Some information was also provided by Ua Huka islanders about algae eaten by residents of Ua Pou Island, which is also part of the Northern Marquesas.
For the Austral Islands, we have information from Rapa, Raivavae and Tubuai islands. In Rapa, the survey was conducted by Claude Payri and Antoine N’Yeurt during a November 2002 field trip to study the island’s algal biodiversity. Tarim Monod, who stayed in Raivavae in 2000, contributed information about this island. He also obtained some information there about other islands in the group, particularly neighbouring Tubuai. Mrs Jany Dautrey, assisted by her Year-12 students from Tubuai junior secondary school, undertook a more systematic survey there in September 2003.²

Several comments should be made on the circumstances under which the surveys were conducted. First, as this project is secondary to our main research programmes, our research strategy and the choice of islands involved—among those where algae are eaten—was dictated largely by research or collaborative opportunities as these arose rather than by a predetermined strategy. Ideally, rather than study Nuku Hiva, which is also part of the Northern Marquesas, we would have preferred to visit a southern island such as Hiva Oa or Tahuata. Similarly, in the Australs, we obtained information in Tubuai and Raivavae, which are culturally very similar, but were unable to conduct surveys in Rurutu and Rimatara (where customary practices are
more fully preserved), which form a separate grouping. Collecting data in Rapa was of prime importance. It is a remote island and culturally very different from the rest of the Austral archipelago. We offer these remarks in anticipation of objections that might justifiably be raised concerning the geographic overlap in our studies, or the gaps where significant differences remained unexplored. We see the present work as essentially providing leads for further research that could shed light on remaining little known areas.

Based on the original Ua Huka study, a survey data form was designed and used as the standard for data collection in other islands so as to obtain comparable information as far as possible. Also, whenever possible, algae samples were collected and herbarium specimens were pressed using standard techniques. Voucher specimens are deposited at the Phycological Herbarium of the Université de Polynésie Française in Tahiti (the specimens are referred to by UPF number). The information gathered was, however, of unequal quality because the survey form was hardly ever precisely completed except for Ua Huka. The reason that the collected data are sometimes unclear is partly the consequence of the varying survey circumstances, such as the limited time for its collection and the extent of interviewer training. However, this lack of clarity is mainly the result of the decline in algae consumption in many areas, and, even where algae consumption is still commonly practised, some traditional knowledge has clearly been lost when it is deemed “useless” for practical purposes.3 This finding points to the urgency of carrying out and continuing research, particularly in the islands mentioned above. Also, since there is virtually no information in print on the practice in French Polynesia, the data we have collected appear to be worthy of publication despite their shortcomings.

ALGAE CONSUMPTION IN THE MARQUESAS AND AUSTRAL ISLANDS

Today, algae are eaten to a varying extent only in the Marquesas and the Austral Islands.4

Algae Consumption in the Marquesas

As previously stated, field studies could be conducted only in Ua Huka and Nuku Hiva, two islands in the Northern Group.5 During the Ua Huka study, we obtained information in Ua Pou Island, also in the north, where some of our informants had lived in the past. We also discovered that algae are eaten in Tahuata in the Southern Group, but without further details. In Ua Huka, as in Nuku Hiva, the generic term for algae is imu. The various species and varieties are of imu are differentiated by a following qualifier that provides a description, often by comparison with another object (hair or root, etc). Six algae species are eaten today in Ua Huka, five of which are also consumed in Nuku Hiva and at least three in Ua Pou.

Species Eaten: vernacular terminology and identification (Figure 2 a - j: The list of species is given in alphabetic order for green and brown algae divisions).
Present-day Consumption of Edible Algae in French Polynesia

- **CHLOROPHYTA** (green algae)
  
  - *Caulerpa racemosa* (Forsskal) J. Agardh var. turbinata (J. Agardh) Eubank (Fig. 2c, Specimens: UPF 800, UPF 2006).
    
    On Ua Huka, this species is known as *imu topua* ‘flower algae’ owing to the appearance of its pinnules, whereas in Nuku Hiva it is called *imu pukupuku* ‘pellet algae’. In Ua Huka, great care is taken when gathering it, so as not to crush its ‘flowers’, and it is carried in a coconut-leaf basket used only for algae to avoid damaging it. This alga is apparently also eaten in Ua Pou. This species is common in shallow water on the fringing reef areas, growing on hard substrata.

  - *Cladophora patentiramea* (Montagne) Kützing (Fig. 2d, Specimen: UPF 0064).
    
    On Ua Huka, this species is named *imu ouoho* ‘hair alga’ as its members are thin and long. It is not eaten in either Nuku Hiva or, apparently, Ua Pou. This species commonly grows on rocks, pebbles and other hard surfaces in calm water under freshwater flow.

  - *Codium arabicum*, Kützing (Fig. 2f, Specimen: UPF 0073).
    
    In both Ua Huka and Nuku Hiva this alga is known as *imu tutae kioe* ‘rat-faeces algae’. As the name implies, its appearance is said to be reminiscent of rat excrement. It is also apparently eaten in Ua Pou. Information from Nuku Hiva may contribute to reinforcing this identification with excrement for reasons other than appearance; it is said that these algae should be eaten soon after gathering, as they give off an unpleasant odour a few hours later. The species grows in shallow water on hard substrata on reef flats.

  - *Ulva flexuosa* Wulfen (Fig. 2a, Specimens: UPF 0819, UPF 2711).
    
    In Ua Huka, it is the most widespread and available among the edible forms and the most commonly consumed. It has several vernacular names, which appear to differ from valley to valley. In Vaipae, for instance, it is known by two names: *imu vai* ‘freshwater alga’ and *imu tapaa* ‘ripe algae’. The latter name apparently refers to this valley’s inhabitants’ practice of waiting a day before eating the algae, which is different from the practice in Hokatu Valley, at least today. In Hokatu, the species bears the name *imu ketaha* ‘encroaching algae’ which attests to its abundance. In Nuku Hiva, where this alga is also eaten, it is known as *imu ouohu* ‘hair algae’. It is said that it is also eaten in Ua Pou Island. This species grows generally on rocky intertidal coastlines.

  - *Ulva lactuca* Linnaeus (Fig. 2e, Specimens: UPF 0818, UPF 2715, UPF 0136).
    
    In both Ua Huka and Nuku Hiva, this species is known as *imu kokuu, kokuu* being the name of a plant, *Sapinus saponaria* (Sapindeceae), that it is said to resemble. In Nuku Hiva, it is also referred to by the name *imu sarata* ‘salad or lettuce algae’, which has more modern overtones. This species grows in shallow waters in the reef flat or rocky coastlines.
Figure 2:  
a. *Ulva flexuosa* (UPF 0819)  
b. *Chnoospora minima* (UPF 1989)  
c. *Caulerpa racemosa* var. *turbinata* (UPF 2006)  
d. *Cladophora patentiramea* (UPF 064)  
e. *Ulva lactuca* (UPF 0136)  
f. *Codium arabicum* (UPF 0073)  
g. *Caulerpa racemosa* var. *typica* (UPF 0669)  
h. *Caulerpa racemosa* var. *peltata* (UPF 031)  
i. *Caulerpa cupressoides* var. *lycopodium* (UPF 2000)  
j. *Caulerpa bikinensis* (UPF 2703)
Present-day Consumption of Edible Algae in French Polynesia

- **HETEROKONTOPHYTA** (brown algae)
  - *Chnoospora minima* (Hering) Papenfuss (Fig. 2b, Specimens: UPF 817, UPF 1989).

  In Ua Huka, this species is called *imu keikei aoa*, a term normally used for young banyan tree roots (*Ficus marquesensis*), which are reminiscent of the algae’s stringy appearance and colour. Nuku Hiva islanders call it *imu makamaka* ‘tree branch algae’, which denotes a similar idea. This alga grows in tufts in the upper level of rocky exposed areas.

  In addition to these well-identified species, names of algae that are allegedly eaten were recorded in Nuku Hiva, but the species to which they referred could not be determined. They have been noted for reference purposes with an eye to future investigation: *imu pua ika kioe, imu hoo kioe* (could be a synonym for the previous species), and *imu huu puaka*. Also, the freshwater green alga *Rhizoclonium riparium* (Roth) Kützing ex Harvey (Specimen UPF 2694), locally known as *imu vai* or *imu tipapa*, is used at Hakau Bay, Nuku Hiva, to prepare a remedy called *raau hati* used for joint and muscle pains.

**Algae Gathering Locations**

Algae are gathered on foot from reef flats below cliffs or from rocks at low tide. We attempted to pinpoint the locations where edible species were gathered. This documented an economic aspect (supply zones) and also recorded societal knowledge concerning the environment. However, this could only be done in Ua Huka where, using collected information sometimes confirmed by on-site visits, we drew up a map showing the locations where the various species eaten today are found (Fig. 3). All locations in the island known to our informants where such algae are to be found are indicated on the map.

A number of comments can be made with regard to Figure 3. The first striking feature is the localised nature of the algae populations in relation to the entire island. Only three population loci of unequal size, all located in the island’s southern section, were identified, i.e., one in Hokatu Bay and adjacent areas, another in the airport area and a very small locus in Vaipaee Bay. Significantly, in addition to Vaipaee’s low algae population (only one species is represented), Hane Bay, also located on the island’s south coast, harbours no edible species. This does not prevent its inhabitants from eating algae gathered in Hokatu Bay and surrounding areas, or in the airport area, which are both nearby.

Also, it would appear that although some locations contained several species, such as Pahonu where sampling was carried out, others sometimes only had one. It should also be noted that in areas where several species are present, these are divided into discrete zones, some of which cover a very small area. Thus part of the Pahonu site mentioned previously has only *Cladophora*, while another part contains only *Codium*. With regard to the Pahonu site, its name indicates that it is visited by turtles (*honu*), and it is likely that they come precisely to feed on the rich algae colony.

Our sources also commented on companion species. For example, wherever *Ulva*
When Ulva flexuosa is found, there is also Ulva lactuca, but when the former disappears, the latter remains on the rocks. The expansive nature of some species was also noted. Ulva flexuosa, for example, which a few years ago was only found in Hokatu Bay’s Titihemouna area, can now also be found in the Hanatea area.

These comments on the spatial distribution of edible species are made on the basis of information provided by the islanders and our own field observations. Certain natural or even human-induced factors can affect the presence of algae. Algae species eaten in Ua Huka, for example, are commonly found on Polynesian reefs and coastlines. The distribution in Ua Huka of the three green algae species (Ulva spp. and Cladophora) follows the pattern regularly found in other island groups wherever there are fringing reef flats pounded by the sea and regularly fed with freshwater runoff from the cliffs that generally stand above such reefs. Similarly, when reef flats are exposed to undertow, brown Chnoospora minima algae are encouraged to develop, and tide pools promote the growth of Caulerpa and Codium.

On Nuku Hiva, the gathering areas are less closely studied and it was merely noted that edible algae are gathered from rocks at low tide in Taiohae and Hatiheu Bays, which are the most accessible areas to where most of the island’s population lives.
Seasonal Variations?

On Ua Huka, Chnoospora, Caulerpa and Codium are usually found all year round at the locations indicated on the map, but there are exceptions. In August 1999 we were unable to find Codium at either of the two locations we were able to visit and where it was supposed to be (Pakeeika and Pahonu). Maurice Rootuehine, who had undertaken the sampling, stated that he was puzzled by this phenomenon, since the algae were usually very common at this location. Our present scientific data are insufficient to explain this. It is not clear whether it might have been because of a drought that had affected the region for several months at the time of the survey. In February 2002, however, when we requested that a sample be collected, Maurice had no difficulty finding it, demonstrating that algae considered to be common can disappear at times.

Ulva flexuosa Cladophora and Ulva lactuca are thought to be seasonal. It is claimed that they are usually found in June, July and August. This was indeed observed during our August 1999 sampling. But informants remarked that if it rained during those months there would be no algae, while a drought and rough seas (which was the case during our stay) would encourage these species to develop.

These observations confirm the seasonal as well as multiyear variations described for the Society Islands’ marine flora (Payri 1987), which are reported for other tropical areas, and specifically for Fiji in the case of another Codium species (South 1993).

Tastes, Preparation and Consumption Methods

Our informants in Ua Huka indicated their preferences among the six species eaten there (information for Nuku Hiva was unavailable). Ulva flexuosa and Caulerpa racemosa are considered the best by all the island’s inhabitants. With regard to the less popular Cladophora, however, differences in tastes are noted between the inhabitants of Hane and Hokatu. While the inhabitants of the former valley enjoyed this alga, the people of Hokatu say they only eat it when there are no other species available.

In both Ua Huka and Nuku Hiva, all these algae species are sometimes eaten raw on the spot or during fishing trips or while gathering molluscs. They are also served at meals. In Ua Huka, Caulerpa is the only algae found tasty enough to be eaten unseasoned, even at meals. Other species are doused with lemon juice, to which coconut milk is usually added. Some species are tenderised before consumption. In Ua Huka, for instance, brown Chnoospora algae must be left to ‘rest’ (mito) for a day, in order to soften it before it is eaten. Nowadays it is also customary to boil it to obtain the same result. When this is done, it is also said to turn green, owing to the deterioration of some of its pigments.

As previously stated, the inhabitants of Vaipaee also apply a resting time to Ulva flexuosa, whereas in Hokatu it is eaten on the day it is gathered—at least, this is the case today. In Nuku Hiva, this same algae as well as Ulva lactuca (which does not undergo any prior processing in Ua Huka) are soaked for a day in seawater to soften them. They are then eaten with lemon juice and coconut milk.
**Austral Islands: Rapa, Tubuai and Raivavae**

In Rapa three species of green algae are eaten, all of which were *Caulerpa*.

- *Caulerpa racemosa* (*konini*) (Fig. 2g, Specimens UPF 2340, UPF 2341, UPF 0669).
- *Caulerpa racemosa* var. *peltata* (*konini*) (Fig. 2h, Specimens UPF 2125, UPF 2126, UPF 0031).
- *Caulerpa cupressoides* var. *lycopodium* (*mamanga*) (Fig. 2i, Specimen UPF 2000).

These species grow in shallow waters on coastlines, on hard substrata (e.g., rocks, coral heads or rubble), generally in sheltered areas. Women gather them on the edge of fringing reef flats and they are eaten in salads with lemon juice seasoning. As coconuts are rare on the island, coconut milk is not used in the dressing.

On Raivavae, *Caulerpa racemosa* is eaten as in Rapa, as well as another *Caulerpa*: *Caulerpa bikiniensis* (Fig. 2j, Specimen UPF 2703). These algae are only eaten raw, often right on the reef. At meals, they are served with lemon juice and eaten with the coconut meat. According to our source, algae are eaten less frequently in Raivavae than in Rimatara and Tubuai, and as might be expected, Raivavae Islanders, being less interested, are less knowledgeable than Rimatara and Tubuai Islanders about such things as the various gathering locations at different times of the year.

This at least is the impression given by a study conducted in Tubuai in 2003 by Jany Dautrey, who did not record highly detailed information from those the people who were interviewed. Two algae species known by the generic term *remu* are eaten in this island, *Caulerpa racemosa* var. *turbinata*, called *remu vine* ‘grape cluster algae’, and another species named *remu haari* ‘coconut-tree algae’, a sample of which we were unable to obtain. Based on the description provided, the latter is probably *Caulerpa bikiniensis*, which is also eaten in Raivavae. Although our information is a little unclear, it would appear that *Caulerpa racemosa*, the more common of the two, is available all year around, though more abundant during the warm season. *Caulerpa bikiniensis* is also said to be gathered during this season. Both are gathered in the shallow water at low tide and very seldom by diving.

Our Raivavae informant provided interesting information on the way Tubuai Islanders collected algae. Unlike the people of Raivavae, who are less interested in algae, Tubuai Islanders apparently practice a form of resource management: while gathering, they only cut the algae rather than pulling it up so that it continues to grow. Gathering is usually a family activity, both men and women taking part. Nowadays, it seems that gathering algae is carried out commercially, particularly during the July festivities. Algae are apparently shipped to Papeete in polystyrene coolers for sale to Japanese tourists. When found in the same location, both species are gathered in the same baskets and are not separated, if at all, until they are rinsed in seawater before eating. They have to be eaten soon after gathering, as they do not keep for much longer...
than three days. Some people refrigerate them, while others prefer to soak them in seawater (but never in fresh water). When algae are not eaten on the spot, they are served as an appetiser with lemon juice and coconut milk, as elsewhere.

A cooked dish using these algae species has also been recorded, although it is unclear whether this applies to both species or not. The algae are set in a half coconut shell, with the meat still in it, wrapped in leaves and placed in an earth oven. Although a little imprecise, not to say questionable, this information is interesting, as it is the only mention of algae cooking in French Polynesia recorded throughout our study.

**DISCUSSION OF RESULTS**

As previously stated, the quality of our information varies considerably from one island to another, making it impossible to provide a comparative commentary on all matters related to algae consumption, and we have had to settle for a few general comments.

*With Regard to Edible Species (Table 1)*

According to the results of our study, ten algae species are eaten in French Polynesia today. The Marquesas are found to have the widest variety both in terms of species and taxonomic groups. In the Austral Islands, only *Caulerpa* (a species of which is also eaten in the Marquesas) are used today, whereas Marquesans eat six different species, five green and one brown algae. *Caulerpa racemosa* is therefore eaten everywhere, which is hardly surprising; it is among the most popular in the world (South 1998,

<table>
<thead>
<tr>
<th>Chlorophyceae</th>
<th>Ua Huka¹</th>
<th>Nuku Hiva¹</th>
<th>Tubuai²</th>
<th>Rapa²</th>
<th>Raivavae²</th>
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<tbody>
<tr>
<td><em>Caulerpa bikinensis</em></td>
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<td><em>C. racemosa var. typica</em></td>
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<td><em>C. racemosa var. peltata</em></td>
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<tr>
<td><em>C. racemosa var. turbinata</em></td>
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<td><em>Cladophora patentiramea</em></td>
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<td><em>Codium arabicum</em></td>
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<td><em>Ulva lactuca</em></td>
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<td><em>Phaeophyceae</em></td>
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<td><em>Chnoospora minima</em></td>
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¹ Marquesas archipelago  ² Austral archipelago
South and Pickering 2005). Some unexpected species, such as *Codium arabicum*, are found in the Marquesas and, along with *C. geppiorum*, were formerly used in Rotuma (northwest of Fiji) in their desiccated form as scouring sponges (N’Yeurt 1996). In Hawai‘i, however, two other species of *Codium* (*C. edule* and *C. reediae*) are either eaten or used in remedies (Abbott 1992). Nonetheless in the Marquesas, it is surprising to discover that the brown algae *Chnoospora minima*, which does not have the most appetising appearance or texture, featured among the edible species.

*With Regard to Methods of Consumption (Table 2 - over page)*

Generally speaking, methods of eating algae are fairly similar in the islands and in the island groups considered, both in when they are eaten (while gathering or in salads at mealtimes) and in preparation techniques. It should be noted at the outset that all algae are eaten raw, with the exception of Tubuai, where unconfirmed information mentions baking. This is the case whether consumption is at the time of gathering or at a meal. As part of a meal, algae are not a dish as such, but are served somewhat like a salad, either as an appetiser or side dish, and usually eaten with lemon juice and coconut milk. There are a few variations, such as a variety of *Caulerpa* (*Caulerpa racemosa* var. *turbinata*) that can be eaten unseasoned in Ua Huka; in Rapa, only lemon juice is used, without coconut milk or coconut meat. Algae prepared with lemon juice and coconut are clearly reminiscent of raw fish preparation, although the aim appeared to be to season rather than “cook” it, however briefly, in the lemon juice. It should be noted that, since lemons are a European-introduced citrus fruit, if algae were eaten before contact with Westerners—which to our mind was the case without doubt—it must have been eaten unseasoned (like raw fish, incidentally) and not prepared in any way, as is the custom when it is eaten on the spot while gathering it. Although *Caulerpa* is usually eaten immediately, the tougher species are traditionally tenderised in various ways: they are left to rest for a day or soaked in seawater or even boiled, as in the case of *Chnoospora*. All such processing methods are peculiar to the Marquesas, which is the only island group were these species are eaten.

*A Few Remarks on Algae Knowledge*

It is difficult to assess the knowledge held by the populations of the various islands studied, insofar as our research effort was not consistent throughout (see above). One general observation can be made, however: the older generations aged over 50 provided more complete and reliable information. This is because young people, even when they know that algae are edible, and who even occasionally gather algae themselves, care little for learning its vernacular names or any other information that do not serve an immediate practical purpose. It is only older people who have retained this type of information.

While the circumstances under which the study was conducted probably affected the results, the Ua Huka islander informants nevertheless appear to have more accurate and detailed information than those of Nuku Hiva, even though their island is located in the same group and has an equivalent number of locally eaten algae species. No doubt, this reflects a slightly more traditional lifestyle that persists to this day and a more regular use
Table 2: Preparation and consumption of edible marine algae in French Polynesia.

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<tr>
<th></th>
<th>Ua Huka(^1)</th>
<th>Nuku Hiva(^1)</th>
<th>Tubuai(^2)</th>
<th>Rapa(^2)</th>
<th>Raivavae(^2)</th>
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<td><em>Caulerpa bikinensis</em></td>
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<td>Raw with lemon juice and coconut milk. Could be cooked?</td>
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<td>Raw with lemon juice and fresh coconut</td>
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<td><em>C. cupressoides</em></td>
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<td>var. <em>lycopodium</em></td>
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<td><em>C. racemosa</em></td>
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<td>Raw with lemon juice</td>
<td>Raw with lemon juice and fresh coconut</td>
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<td>var. <em>peltata</em></td>
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<tr>
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<td>Raw with lemon juice and coconut milk</td>
<td>Raw with lemon juice and coconut milk. Could be cooked?</td>
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<td>var. <em>turbanata</em></td>
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<td><em>Codium arabicum</em></td>
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<td>Raw with lemon juice and coconut milk</td>
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<th>Nuku Hiva	extsuperscript{1}</th>
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<th>Rapa	extsuperscript{2}</th>
<th>Raivavae	extsuperscript{2}</th>
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<tbody>
<tr>
<td><em>Ulva flexuosa</em></td>
<td>Treatment before eating: let to stand for one day (at Vaipae). Eaten with lemon juice and coconut milk</td>
<td>Treatment before eating: soaked for one day in seawater. Eaten with lemon juice and coconut milk</td>
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<tr>
<td><em>Ulva lactuca</em></td>
<td>Raw with lemon juice and coconut milk</td>
<td>Treatment before eating: soaked for one day in seawater. Eaten with lemon juice and coconut milk</td>
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<tr>
<td><em>Chnoospora minima</em></td>
<td>Treatment before eating: let to stand for one day, or boiled. Eaten with lemon juice and coconut milk</td>
<td>Treatment before eating—not documented. Eaten with lemon juice and coconut milk</td>
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	extsuperscript{1} Marquesas archipelago  
	extsuperscript{2} Austral archipelago
of natural resources, particularly in the small Hokatu Valley, where the survey was carried out. Such disparities may possibly be found among the Austral Islands, particularly if studies were to be carried out in Rimatara, which has similar characteristics in relation to Rurutu as Ua Huka to Nuku Hiva. The apparent paucity of our information in this island group is, among other things, a result of the way the surveys were conducted, i.e., most probably less intensively than in Ua Huka. It can also be attributed to the fact that algae species are not often eaten, and all belong to the *Caulerpa* genus. Having similar characteristics, these species are all eaten in the same way and do not require the specific processing that several species in the Marquesas do. This is possibly why people required less knowledge and have less to say about them.

When algae names and their meanings were recorded, it was observed that, other than in Rapa, the generic terms referring to algae (*imu* or *remu*) are followed by an adjective that described and particularised the species concerned by comparing it with a flower or leaf, or to rat droppings, hair etc. It is significant that the term *sarata* is used in Nuku Hiva, associating algae with lettuce, which is both botanically and culinarily European, and *remu vine* in Tubuai, drawing a comparison with grape clusters. European influence can be discerned here in new descriptive terms (which result from a change in representations) that have been substituted for or added to those that must have previously existed or still remain as redundant epithets.

*Broadening the Scope: Time and Space*

Despite its shortcomings, the information we were able to collect during these studies makes it possible to shed light on current dietary behaviour in French Polynesia about which little is known. One of the purposes of this study was to delve into these societies’ pre-European past. When reconstructing a people’s lifestyle before contact, archaeologists pay close attention to the way the islands’ resources were used by their ancestral inhabitants. Their aim is not only to document a society’s economic basis, but also probe as far as possible into the conceptual dimension of their relationship with their natural or domesticated environment, i.e., descriptive terminology and classifications, symbolic representations, myths and beliefs, etc. By their very nature, archaeological data relating to material activities seldom provide access to this dimension and, when they do, it is both ambiguous and very limited. The survival of some activities until recent times, and sometimes even to the present day, makes it possible to acquire a set of data through oral surveys and observations that under certain circumstances, which need to be assessed, are applicable to the pre-European period. Such data can enrich our knowledge of material aspects of resource use as revealed by studying archaeological remains and thus partially restore its immaterial dimension.

Algae eaten as food is an area that illustrates the potential for just such an ethno-archaeological approach. Such a survival of the past in a way constitutes a glimpse of a practice that has endured and can therefore be directly apprehended in detail, although no material trace would corroborate it using a standard archaeological approach. A probable pre-European cultural practice can therefore be documented with some accuracy, thus contributing to reconstructing the relationship between the ancient Polynesians and their marine environment.
With regard to the Marquesas, where it was possible to study the activity in some
detail, the practice is barely mentioned in anthropological and historical literature
(Robarts 1974:279), though this does not deny its pre-European nature. More recent
anthropological literature is, to our knowledge, silent on the issue, perhaps because
it escaped observation or was deemed of little value.

As far as the rest of Polynesia is concerned, historical sources from the time of
contact and immediately before it are very brief about the practice, even though
they do mention it. Oliver (1974:25), for example, out of a total of 1,419 pages of
painstakingly researched Society Islands’ cultural history merely writes, “Some
algae were occasionally used by the Maoris as a food supplement.” As for the 20th
century, Setchell (1926:69) also reports that $Ulva\ lactuca$, known as $rimu\ miti$ ‘salty
algae’, was at one time eaten in Tahiti. However elusive it may be, this note proves
that, up until the relatively recent past, algae consumption was practised in a wider
geographical area than observed today and it can be assumed that it would have been
even more widely distributed in the past. Although further refinements may need to
be made, it would nevertheless appear reasonable to assume that why so little has
been said about it merely reflects the situation in ancient times. Quite simply, that
algae was not eaten in large quantities in what is today French Polynesia, as compared
with Hawai‘i, where it was traditionally eaten in abundance and where some 30 algae

TOWARDS HAWAI‘I

Insofar as the inhabitants of Hawai‘i probably originated from the Marquesas, it
is noteworthy that this island group within French Polynesia is where the greatest
number of species is still eaten. With regard to the larger share of the Hawaiian diet
traditionally provided by algae, it would be interesting to distinguish between the
deterministic influence of a much richer edible algae supply and a choice made for
social and cultural reasons. This is beyond the scope of our study, but a few preliminary
comments can be offered.

The larger number of species eaten in the Hawaiian Islands is definitely linked
to its more abundant flora, but also to the geomorphology of its coastlines, where
many tidal pools and reef flats are accessible at low tide and from which algae may
be easily gathered on foot. For the pre-European era, Abbott (1991) explains the
abundance and diversity of algae in the Hawaiian diet in two ways: gathering was
carried out by women because of the tight dietary restrictions ($kapu$) imposed on them
(Valeri 1985), and the coast along which they could gather algae and other marine
invertebrates was nearby.

A second significant point is that, as far as we know, red algae is not among the
species eaten in French Polynesia, while in Hawai‘i (as well as Fiji and Rotuma) it is
the most numerous and popular. As far as the Marquesas are concerned, there is an
obvious natural explanation: these species are absent from their reefs. The red algae
do exist in other island groups, however, but it is impossible to ascertain whether they
used to be eaten there in the past. Similarly, the green algae species $Codium\ geppiorum$
is much sought after in Hawai‘i and many other Pacific islands but, to our knowledge,
it is not eaten in French Polynesia, although commonly found on its reefs.
Our observations raise a number of questions that cannot be answered without more thorough documentary research and, especially, additional studies on traditional algae use in the Marquesas and Austral Islands.

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NOTES

1. Although this is not specific to the case in hand, particularly among younger generations.
2. As part of the “2003 Science Festival”.
3. As in Nuku Hiva, this survey was part of the “2003 Science Festival”.
4. Very recently, some inhabitants of the Gambier Islands who are in touch with Austral Islanders have started eating algae, which they did not do, in recent decades at least.
5. It is unfortunate that information for comparative purposes is unavailable from the Southern Group.
6. According to our sources, edible algae can only be found in the locations indicated on the map. Insofar as these areas are in the island’s inhabited part, with the notable exception of Hane, it could be suggested that the information provided is partly because our informants visit some regions while neglecting others, and algae could well exist elsewhere unknown to them. However, some of these informants were highly active fishermen who knew the whole island well and all agreed on this point. This would tend to indicate that the distribution map is, in theory, accurate. It would no doubt be useful to verify the information by field observations.
7. Several of the algae types mentioned here were recorded by Claude Payri from the stomachs of turtles from the Tuamotu atolls to the southeast.
8. Although, as the survey was carried out by someone who had not been trained in this type of work, mistakes in data collection may have distorted the results.
9. This algae’s name is derived from the fact it resembles a coconut palm, on a much smaller scale of course.
10. As indicated recently in South and Pickering (2005), such attention to the way algae is gathered seems rare. These authors document a similar type of management in the village of Gunu (Fiji) as exceptional.
11. Caution should be exercised, as this information was supplied by our contact in Raivavae who did not appear to have directly observed the practice in Tubuai.
12. This is only a provisional figure, as several islands in the Marquesas and Australis where algae are eaten were not studied. Nevertheless, even if the true number is higher, it would not far exceed the amount stated above and the proportion between island groups would likely remain the same.
13. Or just with coconut milk or some added condiment that has been forgotten and replaced by lemon juice.

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