

Rice paper: Overview for materials and traditional production process in Vietnam

Le Pham Tan Quoc^{1,*}

¹Institute of Biotechnology and Food Technology, Industrial University of Ho Chi Minh City, No. 12
Nguyen Van Bao, Ward 4, Go Vap district, Ho Chi Minh city, Vietnam.

*E-mail: lephamtanquoc@iuh.edu.vn

Abstract

By reviewing various previous studies on rice products, this mini review elaborates the picture of production of rice paper, especially nutrition and technology process. Rice paper originated in Vietnam as a traditional food. It was consumed a huge quantity in Vietnam and can be used every meal in Vietnamese. Besides, rice paper production can improve the income of local citizens.

Keywords: Banh trang, sheet, tapioca, traditional food, rice paper.

1. Introduction

Each region of the world has its own unique food culture, especially Southeast Asia. Each country has its own traditional ways of using rice. Rice is used in different forms including rice noodles such as Bun in Vietnam, Khanon Jeen in Thailand (Uchimura et al., 1991) or some other rice products such as Nime Chao in Cambodia, etc. Among rice product, rice paper is very specific of Vietnamese food mainly because it has the easy preservation, long shelf-life and can mix with many other ingredients although it has the low nutrition (Nguyen et al., 2007).

Rice paper is called “Banh trang” or “Banh da nem” (Vietnamese name). It has also different names depending on different regions. This is a traditional food in Vietnam during centuries. It was first made in the South of Vietnam and then spread throughout the country. Rice paper production is a cottage industry, styles of which vary from region to region. First, they soak rice in water and grind it in a mortar by hand or using a machine to make a milled-rice (milky liquid), which is followed by a second soaking overnight. The milled-rice is then spread thinly, like a crepe, onto a cloth mould, steamed and dried under sun to obtain rice papers (Nagano, 2000). Depending on various tastes, they can mix tapioca flour into the mixture of milled-rice.

In Vietnam, there are many trade villages to produce rice paper such as Phu Hoa Dong (Cu Chi province), My Long (Ben Tre province), Luu Bao (Hue province), Trang Bang (Tay Ninh province), etc. with various tastes and technologies. From this rice paper, Vietnamese people can process many kind of food, for example salad rolls, nem rolls, cha gio, etc. The fresh rolls are then rolled up and ready to be eaten but some kinds of rolls have to fry before using (cha gio). They can wrap and roll many main foods such as vegetable, boiled pork, boiled shrimp, etc.

Fresh rolls can be served with fish sauce or hoisin sauce (which consists of ground fermented peanut bean and mixed coconut water, before being stir-fried with garlic, sugar and then sprinkled with chili powder and ground peanuts) (Herman, 2012). Rice paper in Vietnam has many shapes (circle, square, triangle shape) but circle shape is quite popular with diameter range from 20 to 40 cm. It is dry, thin,

crisp and translucent round sheets. The sheets are usually dipped briefly in water to soften them before wrapping around other ingredients. Although, this product was widely used in Vietnam but the majority of people on the world do not know about this product and rice paper processing is very interesting. Therefore, this study presents the production process of this product in Vietnam with the purpose of exploring the possibility exported rice paper.

2. Nutrition of rice paper

Main ingredients of traditional rice paper consist of rice, tapioca, salt and water in specific ratio. Role of these ingredients is different. Some local area, they use 100% rice powder to produce rice paper (not adding tapioca), so the obtained product is very crisp and opaque. Hence, until now they usually add tapioca into mixture to improve elasticity and translucence of product. Salt in product can improve tastes and inhibit the growth of microorganism, so the self-life of rice paper can extend a year. Table 1, 2 and 3 show that rice paper has the low nutrition. The number of calories in a rice paper depends on the percentage of rice and tapioca powder it contains.

3. Traditional rice paper processing

Figure 1 shows that the non-glutinous rice was soaked in water from 3 to 5 hours to make the granule swellings, clean impurities, soften rice and facilitate easily grinding process. Then it was drained, ground into a milky liquid with water. After that, the mixture is mixed salt (0.5-1%, w/w) and tapioca powder (rice/tapioca ratio of 4/1, w/w). When the liquid is ready, using a coconut shell spoon pours a thin layer onto a cotton fabric which covers over a boiling pot of water (temperature of 95-100°C). Once it cooks (after 30-40 seconds), using a thin bamboo stick hangs it on a bamboo woven mat in the sun. Drying time depends on sunlight, so it is flexible (from 2 to 4 hours) (Figure 2, 3, 4 and 5). When sheets easily fall from bamboo mat this means that it is ready to use. The fuel for the steaming process is sawdust, coconut fiber, coal and firewood.

4. Some other rice papers in Vietnam

Currently, there are many type of rice paper with various raw material such mango (Figure 6), wheat flour (Figure 7). Some time they can added corn flour, mung bean flour and coconut water to the liquid to make the rice paper taste better, along with some seasoning like sugar, pepper or salt. The top rice paper was sprinkled sesame seeds, onion, shredded coconut meat and tiny shrimps, etc. It's all up to personal taste and creativeness of local citizens. In addition, they can modify the rice paper thin or thick and it depends on what one uses the end result for. They use the thick version for baking (Figure 8) and the thinner one for wrapping food (Figure 9).

However, the traditional rice paper was modernized but there are three new things compared with classical method. They use the pourer, steamer and dryer to produce rice paper (Figure 10, 11, 12). The yield increase dramatically hundred times. The modern rice paper has the big size (nearly 40 × 200 cm) (Figure 13), so they have to trim for requests of customer.

5. Conclusion

Rice papers are commonly considered as a food having less chance to be affected by microorganisms because of the low nutrition and moisture. Traditionally, they are made from milled-rice and other sub-ingredients. This product was widely used in Vietnam with many tastes. It can improve the income of local citizen and has the strong export potential.

6. References

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Tables

Table 1. Nutrition of rice powder

Chemical components	Amount per 100 g	Chemical components	Amount per 100 g
Moisture	10 g	K	76 mg
Energy	359 Kcal	Ca	24 mg
Protein	6.6 g	P	135 mg
Lipid	0.4 g	Fe	1.9 mg
Carbohydrate	82.2 g	Vitamin B ₁	0.08 mg
Ash	0.4 g	Vitamin B ₂	0.05 mg
Na	-	Vitamin PP	2.1 mg

(Source: Nguyen et al., 2007)

Table 2. Nutrition of tapioca

Chemical components	Amount per 100g	Chemical components	Amount per 100g
Moisture	14 g	Ash	0.1 g
Energy	341 Kcal	Vitamin B ₁	0.04 mg
Protein	1 g	Vitamin B ₂	-
Lipid	-	Vitamin PP	-
Carbohydrate	84.3 g	Na	-
P	50 mg	Fe	2 mg
		Ca	30 mg

(Source: Nguyen et al., 2007)

Table 3. Nutrition of rice paper

Chemical components	Amount per 100g	Chemical components	Amount per 100g
Moisture	15 g	Ash	1.4 g
Energy	333 Kcal	Ca	20 mg
Protein	4 g	P	65 mg
Lipid	0.2	Fe	0.3 mg
Carbohydrate	78.9 g		

(Source: Nguyen et al., 2007)

Figures

Figure 1. Flow chart of rice paper

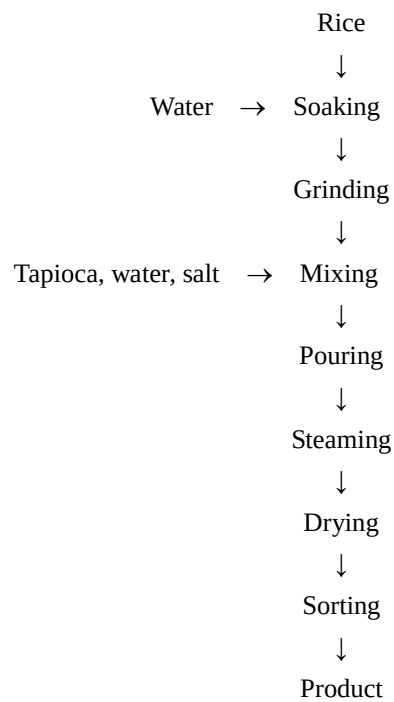


Figure 2: Pouring and steaming the rice paper onto a cotton fabric



Figure 3: Separating rice paper from a cotton fabric



Figure 4: Hanging rice paper on a bamboo woven mat



Figure 5: Drying rice paper in the sun



Figure 6: Mango paper



Figure 7: Wheat paper



Figure 8: Baked sesame rice paper

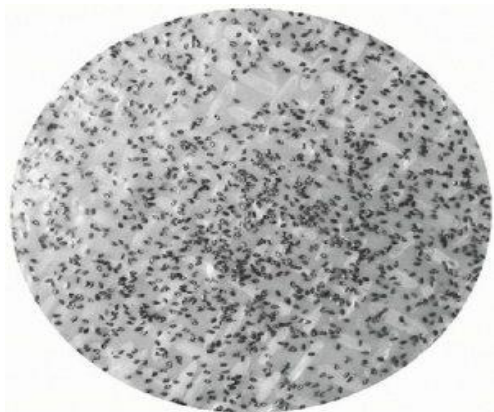


Figure 9: Thin rice paper



Figure 10: Pourer machine



Figure 11: Steamer machine



Figure 12: Dryer machine



Figure 13: Rice paper after drying

