Alteration of Cultivated Rice in Indochina

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Since 1963, the author has made research upon the rice cultivation in Indochina. Several types of rice are grown in this region. They are, for instance, lowland rice and upland rice, ordinary rice and glutinous rice, so-called *indica* and *japonica*. It is yet to be determined, however, in what sequence they were grown and altered in Indochina, the region which is thought to have a close relation with the origin of this crop.

Though this report is based on his investigation, it may be far from the sufficient explication on the alteration of cultivated rice in Indochina. Therefore, the author would like now to describe mainly on the investigations in Thailand, Cambodia and Laos.

Material and Method

It is desirable to examine the paddy or brown rice discovered by archaeological excavation for the studies on the ancient rice cultivation in this region, but it is impossible to place much hopes on this method for the establishment of systematic investigation.

The author examined comparatively the chaff contained in the bricks of old edifices, that is, temples and ramparts, because many remains of old brick edifices are found all over Indochina.

Fig. 1 shows one of the examples which indicates obviously the contained chaffs.

These chaff-containing bricks are found in Thailand, Laos, Burma and in some regions of India, and it is considered that they can render useful materials for the studies on the alteration of cultivated rice. But the chaff-containing bricks were found very rarely in Cambodia; therefore, it must be remembered that the materials for the investigation in this country were not sufficient.

Fig. 1. Rice husks contained in a brick

The author has collected 160 chaff-containing bricks which are the materials to make

known the alteration of cultivated rice extending over 1,500 years from sixth century A.D. to the 19th.

Some of the chaffs were found with nearly perfect shape. These chaffs from 10 to 50 in number were picked out from one brick and the length and width of each chaff were measured, and according to the results, these grains were classified into three groups, that is, round type (R), large type (L) and slender type (S).

The kind of rice plant which produced these grains was discussed considering the habitats of the regions where the grains of each type were distributed.

Distribution of grain types in every place

The term during 1,500 years after sixth century A.D. can be divided roughly into the following four periods for the convenience of description: 1) the period from the sixth to the 11th century, 2) from the 11th to the 15th, 3) from the 15th to the 18th, and 4) the period after the 18th century. Table 1 shows the major type of grain in each period.

Table 1. Distribution of grain types in various periods

A. D.	Laos	Thailand			Cambodia
		North	Central	North-east	
6—11	R, L	R	R, L	S, L, R	S
11—15	R, L	R, L	R, S	L, S	S
15—18	R, L	R, S	S, R	S, R, L	—
18—	—	R	S	S, R, L	—

L : large type
R : round type
S : slender type

The period from the sixth to the 11th century was called Dvaravati in Thailand and this corresponds to the period of the establishment of Angkor in Cambodia.

The R type is the majority of this period in Thailand and the L type succeeds to it. The S type is slightly found in north-east Thailand, the neighboring districts to Cambodia. On the contrary, the bricks discovered in Cambodia usually did not contain any grain but if contained, it was the grain of the S type.

From the 11th to the 15th century, the R type always distributed dominantly all over Thailand and Laos and the L type followed it.

The S type which had not been recognized in these districts appeared in the Menam Valley of central Thailand. This is a noteworthy change of this period.

From the 15th to the 18th century, the distribution of the S type developed and spread rapidly from the Menam Valley and attained almost to the same extent as that of the R type. On the other hand, the distribution of the L type decreased continuously since the former period and disappeared in central Thailand.

After the 18th century, the S type increased exclusively and distributed dominantly in central Thailand.

And the R and L types were found only in north and north east Thailand.

It is indeed an interesting fact in the alteration of cultivated rice in Indochina that such a change occurred in the 18th century.

Process of alteration of cultivated rice

What kind of cultivated rice are the three types of grain described above? This is the next problem. The author wishes to solve it with some presumption as follows:

The distribution of the L type was limited in the northern mountainous region of Thailand, in the environs of Kanjana Buri which is located on a border district of Burma, in Khorat Plateau and in the northern part of Laos. It may be presumed from these facts that the L type must be upland rice.

As for the investigation of the varieties of the R type rice, it is necessary to pay attention to the existence of the "Glutinous Rice Zone" which covered the areas of all Laos, the northern and north-eastern part of Thailand, the north-eastern area of Burma and some

regions of Yunnan.

In the 19th century, the R type rice was distributed mainly in this zone. Consequently, it is presumed that the rice of the R type belongs to the glutinous rice. Furthermore it is also presumed that this type of rice is one of the lowland rice which had been cultivated in plain fields because the major distribution of this type had been found since early times in the areas of sufficient water supply, that is, the Ping, Yom Valley of north Thailand and the lower reaches of the Mun, Song Khram of north-eastern Thailand.

The rice of L and R types may be concluded from their grain types as *aus* or *japonica* like variety. The rice of these types was distributed in the region along the Mekong and tributaries from Yunnan to the South China Sea or to the Gulf of Siam. The author wishes to call it tentatively the rice of the "Mekong descent group."

The upland rice of the L type seems to have been cultivated in Indochina for a longer time than the lowland rice of the R type.

The S type rice was gradually distributed and spread over Indochina during past 1,500 years. Before the 11th century, the distribution of this type was limited in north-eastern Thailand but it increased to the extent as much as that of the R type in the period from the 15th to the 18th century in central Thailand and after the 18th century it was distributed as the perfect dominant type of this area.

The rice of this type was scarcely found in the "Glutinous Rice Zone." This means that the rice of the S type is non-glutinous lowland rice. And the shape of the grain of the S type suggests that this rice is similar to what is called *aman* of *indica*. The latter is regarded as a group of rice of which distribution covers the area from the delta plains of Indochina to the Indian continent passing through Burma and Bangladesh.

Therefore, the author wishes to call it tentatively the rice of the "Bengal descent group." This is the rice cultivated since a long time ago in Cambodia but not in Thailand. The S type rice was propagated in Thailand far later than that of the L or R type.

Conclusion

The alteration of cultivated rice in Thailand can be briefly described as follows; L type→R type→S type.

In other words, the cultivated rice in Thailand seems to be altered from upland rice to glutinous lowland rice and subsequently to non-glutinous lowland rice. But this alteration did not succeed the non-glutinous lowland rice in north and north-eastern Thailand and also in Laos.

Non-glutinous lowland rice of the "Bengal descent group" was cutlivated in Cambodia since a long time ago. This is the different point of the alteration of cultivated rice between Cambodia and Thailand or Laos though they are countries of Indochina.

Although it is impossible to describe completely the alteration of rice cultivated all over the Indochina Peninsula only in terms of some facts of the past 1,500 years in these countries, it may be possible to describe with some accuracy the general trend of cultivated rice alteration in this area.

The author was much interested that Indochina's ancient cultivated rice belongs to the "Mekong descent group" and the present one to the "Bengal descent group" which has been distributed recently in this region.

This fact may offer an important suggestion on the investigation of the origin and the way of propagation of cultivated rice which are not yet well known. These problems should be studied in the future in cooperation with anthropology and history.

References

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