The Cultivation of *Curcuma rosesana* (Zingiberaceae) from Thailand in Harbin

Wei Lijun[(1)], Yang Qian[(1)], Wang Chen[(2)] and Liu Mingyuan[(2)]
[(1)]Harbin Institute of Technology, Harbin, China
[(2)]Harbin Teacher's University, Harbin, China

ABSTRACT

A wild species of Zingiberaceae is found in the North of Thailand. The extract of its rhizome is used to sterilize and clean the air. In order to identify its classificational status and make good use of it, we planted it in the greenhouse in Harbin, China following the culture method used for ginger. After 15 months cultivation in greenhouse in Harbin, it bloomed in August 2000. It was identified as *Curcuma rosesara*. The result shows that although *Curcuma rosesara* is wild in Thailand, it can be cultured in greenhouse in Harbin, the rhizome is bigger after growing in Harbin than in Thailand so in can be cultivated in greenhouse to get more rhizome for medical use.

KEYWORDS: *Curcuma rosesara* culture in greenhouse identification

1. INTRODUCTION

The plant order Zingiberaceae is distributed in the tropics and the subtropical zone around the world, and mainly grows in the tropics in Asia. Many species of this family are famous medicines that can benefit the stomach, relieve pain or be used as spices [1]. In the north of Thailand there is a wild species of Zingiberaceae, which an old herbalist used to sterilize and clean the air. He recommended it to the Prime Minister of Thailand in 1998 and he shows great interest to it. In January 1999, we got the rhizome form Dr Krisana Kraisintu, The Government Pharmaceutical Organization, Thailand and cooperated with her. In order to identify its classificational status and obtain morn output of rhizome, we culture it in the greenhouse in Harbin Teacher's University in China.

2. MATERIALS AND METHODS

Materials

The rhizomes of Zingiberaceae kindly provided by Dr. Krisana Kraisintu and Dr. Dusanee Thanaboripat were grown in the greenhouse in Biology Department of Harbin Teacher's University from May 1999 to October 2000.

Methods [2]

1. Be exposed to the sun

20~30 days before planting, the rhizomes were exposed to the sun on the clean ground for 1 or 2 days. Every evening they were taken into house to avoid low temperature.

2. Pile

After the rhizomes were exposed to the sun for 1 or 2 days, the rhizomes were piled up in the room for 2 or 3 days, and covered with straw curtain. The first and second steps were repeated for 2 or 3 times before germinating.

3. Accelerate the germination

In the north of China, we can accelerate the germination in the middle of April in greenhouse. The rhizomes were surrounded with wheat straw in the dark for almost 20 days at 22~25 °C. During this period, we must pay attention to the water supply. If it is too dry, the rhizome will not germinate, while if it is to wet, the rhizome will rot

4. Separate the rhizome

The rhizomes were separated into small parts, each part was about 75g, and carried a single strong bud.

5. Soil preparation

Two big wood boxes (60 x 30 x 30 cm) were prepared to plant the rhizome, and enough soil together with fertilizer was put in the boxes.

6. Watering

1 or 2 hours before planting, the soils were irrigated, but not too much.

7. Planting

Put the rhizome on the soil. Gently pressed the rhizome into the mud until the bud and soil were at the same level, and then covered with soil 5 cm thick.

8. Culture

Not until 70% of bud got out of the soil, did we water the soil. In the later period, the soil humidity was sustained at 70-80%.

9. Fertilize

The rhizomoes were fertilized with N, P, K for three times before dormancy.

10. Earth up

The underground rhizomes need dark and damp soil, so we should earth them up during autumn.

11. Sunshade

The species in Zingiberaceae are shade-resisted; they need middle intensity of illumination, but non-resistance to strong sunshine.

12. Living through the winter

The plants were grown in greenhouse during the winter. The temperature was kept above 15 C, and the plants were carefully watered. The intensity of illumination was sustained about 20000-35000 LUX.

3. RESULTS AND DISCUSSION

The shape of rhizome is just like ginger but slightly thinner. The cross section of rhizome is light yellow in color and has a light fragrance. Under in this study, the plant can grow to 2 meters. The leaves are big shaped in long ellipse, 30 cm in length and 15 cm in width.

After the plant was cultured for 15 months, it bloomed on August 1, 2000. The compound-spike comes out from the top leaf sheath, shaped in cylinder, 17 cm in length and 6 cm in diameter. The bracts are egg-shaped, light green in color and its top is obtuse. The bracts on the top of the inflorescence are sterile, and they are narrower, sharp on the top end, white in color and with light red on the edge. Each bract fuses in the bottom to form pouches. Each pouch subtends a cincinnus to flowers. The calyx is white and more than 1 cm long, like a tube with a split in one side, tooth-like on the top. The coralla is white, and coralla tube is more than 3 cm long with its top part expanding. The lobes of the coralla are triangles, 1.5 cm in length, the one in the rear is a little bigger, with thin tip. The lateral degenerate stamens are petal like, and separate from labellum, but

shorter than labellum. The bottoms of stamens connect with the bottoms of filaments and labellums to form a tube. The labellum is egg shaped upside down. There are two curled lobes on the top with 1.2-2 cm in length, light yellow, with deep yellow in the middle part. There is only one developed stamen, with a slot in filament, and its anther has two cells nestling to each other. There are two spurs at the bottom of the stamen, and the anther split from side. There is one filiform style, passing through the slot of filament and growing out between the anther cells. The stigma is head like. The two lanceolated glands are almost flesh like and surrounding the bottom of style. The locule is below, covered with hair, 3 cells, axile placentation and there are many ovules.

According to the above character [3][4][5], Prof. Liu Nian, Huanan Institute of Botany, Chinese Academy of Science who mainly studies the plant in Zingiberaceae identified the plant to be *Curcuma rosesara* according to the photos of rhizome with cross section, the plant with compound-spike and flowers (Figures 1-4).

4. ACKNOWLEDGEMENTS

We would like to express our gratitude to Dr. Krisana Kraisintu and Dr. Dusanee Thanaboripat for giving the rhizomes of Zingiberaceae, and to Prof.Liu Nian for his identification.

REFERENCES

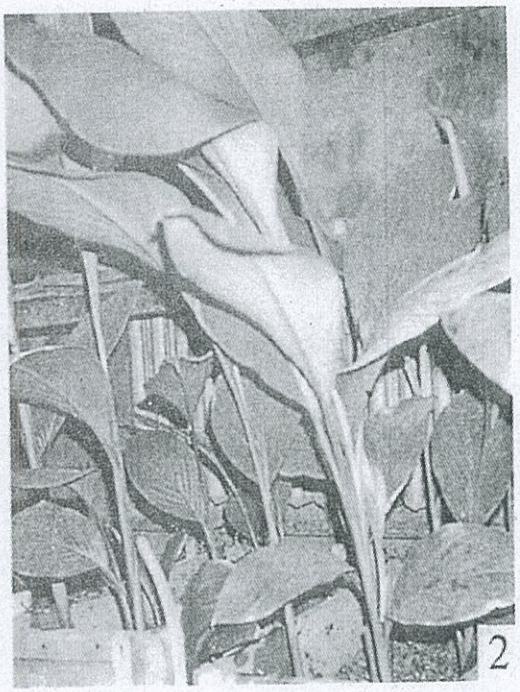
[1] Delectis Flora Reipulicae Popularis Sinicae Agendae Academiae Sinicae Edita, Flora Reipulicae Popularis Sinicae., *Science Press*, *16*(2), **1981**, 58-63.

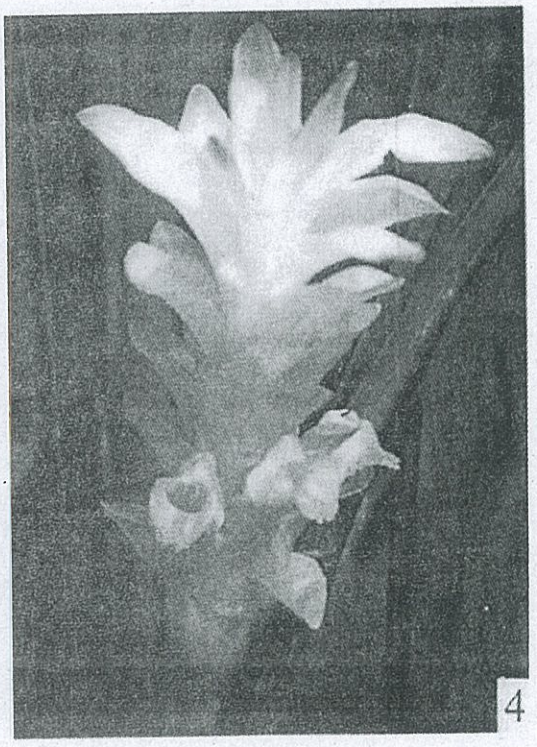
[2] Zhao Dewan, *et al.*, *Zingiberaceae Cultivation Technique* (Jindun Press, **2000**), 88-126.

[3] Xie Fengxun, *A Colour Atlas of Traditional Chinese Medicines with Text on Techniques of Their Cultivation* (Jindun Press, 1994), 231-232.

[4] He Hong, *et al.*, *Herb and Animal Medicine and Their Growing and Processing Technique* (Jindun Press, 2001), 79-83.

[5] Medicine Dictionary Editing Committee of Health Ministry of P R China, *Medicine Dictionary of P R China* (Guangdong Science and Technology Press, Chemistry Industry Press, 1995), 178-179.





Figures 1-4: 1) rhizome 2) the plant without flowers 3) the plant with flowers 4) the compound spike