Some Notes on the Rhododendron Plants from Japan XV: Ridges of an Aerial Cell Wall in Corolla

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	作成者: Kurita, Masahide, 栗田, 正秀
	メールアドレス:
	所属:
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Masahide KURITA*: Some Notes on the *Rhododendron* Plants from Japan XV. Ridges of an Aerial Cell Wall in Corolla

栗田正秀*：日本産ツツジ属植物雑報（十五）花冠細胞の表面膜の隆起

In some plant species, an aerial wall of epidermal cell has been reported to have protrusions, ridges or cracks on a surface of its cuticle. FITTING (1931) has mentioned that the cuticle is often somewhat folded and in surface view appears striated. According to PRIESTLEY (1943), an origin of relief pattern in the cuticle of a floral part has been ascribed to the effects of cell growth.

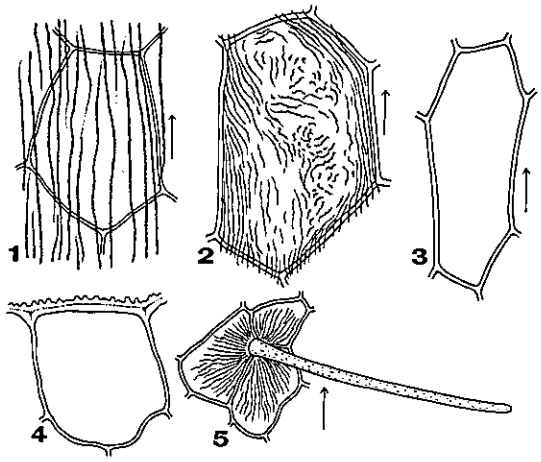
In this paper, there will be noted an appearance of cuticle in the corolla of certain *Rhododendron* species.

Materials and Method

The material plants are shown in table 1. The epidermal cells for an observation were obtained from an upper and a lower part in each of an inner and an outer epidermis in an uppermost petal. The observation on the 4 preparations from the single petal was carried out within a few hours. In the cells from the upper part of outer epidermis, the number of ridges was counted on 10 μ segment of line which made a right angle with the longitudinal axis of the petal.

Table 1.

Species	Localities	
Rhododendron japonicum (A. GRAY) SURING.	(cult.)	Asahi-cho, Mie-gun, Mie-ken
Rh. pentaphyllum MAXIM.		Mt. Gozaisho, 〃
Rh. reticulatum D. DON		Akatsukidai, Yokkaichi-shi, Mie-ken
Rh. macrosepalum MAXIM.		〃
Rh. ripense MAKINO	(cult.)	〃
Rh. obtusum (LIND.) PLANCH. var. *kaempferi* (PLANCH.) WILSON.		〃
Rh. degronianum CARRIÈRE.	(cult.)	〃



Figs. 1—5. Ridges in epidermal cells of uppermost petal of corolla. 1, *Rh. reticulatum*, surface view of cell from lower part in an outer epidermis of petal. 2, *Rh. degronianum*, the same from upper part in an inner epidermis. 3, *Rh. ripense*, the same from lower part in an outer epidermis. 4, *Rh. reticulatum*, cell of outer epidermis in transversal section through lower part of corolla. 5, *Rh. japonicum*, cells surrounding a base of hair.

In Figs. 1—3 and 5, a top of petal in direction of arrow. Figs. 1—4, ×420. Fig. 5, ×160.

Observation

I. *Rhododendron japonicum, Rh. pentaphyllum, Rh. reticulatum, Rh. obtusum* var. *kaempferi* and *Rh. degronianum*

In the 5 species, many thin lines are found on a surface view of the cell from the lower part of the inner and of the outer epidermis of the uppermost petal. The lines are parallel or nearly parallel with the longitudinal axis of the petal and they scarcely branch. In almost all cases, a single line in a cell makes a straight advance into the adjacent cell on or beneath the former cell (Fig. 1). The cell from the upper part of the inner and of the outer epidermis of the petal shows many lines too, as found at the cell from the lower part mentioned already. However, the lines have a tendency to be disturbed in their directions and to be divided into small segments, especially in a central area of cell (Fig. 2).

In a transversal section through the lower or the upper part of the petal, an aerial wall of epidermal cell

*2-98, Akatsukidai 2 chome, Yokkaichi, Mie Prefecture, 512 Japan
三重県四日市市あかつき台2丁目2-98（〒512）

shows many minute protrusions (Fig. 4). These appear to consist only of a cutin and must make the lines on the surface view of the epidermal cell. Namely the lines are ridges on the aerial wall of the cell.

Table 2 shows the number of ridges. It is probable that *Rh. japonicum* has more ridges than those of any other species.

Table 2.

Species	Number of ridge*
Rhododendron japonicum	9.2
Rh. pentaphyllum	4.0
Rh. reticulatum	3.4
Rh. macrosepalum	5.8
Rh. ripense	4.3
Rh. obtusum var. *kaempferi*	4.6
Rh. degronianum	5.9

* Refer to text.

There are found long unicellular hairs on the corolla of *Rh. japonicum*. The epidermal cells surrounding the base of each hair have a tendency to show many radial ridges from the base of hair (Fig. 5), instead of ordinary ridges which are parallel or nearly parallel with the longitudinal axis of petal.

II. *Rh. macrosepalum* and *Rh. ripense*

The 2 species are distinguishable from the 5 species mentioned already by having no ridge (Fig. 3) in the following cells: 1) all or almost all cells from the lower part of the outer epidermis of petal and 2) fairly many cells from the same part of the inner epidermis.

Discussion

The ridge on corolla cuticle is probable to be formed at the same stage of apical growth in petal as found in a leaf development. Owing to a rapid elongation of petal cell, the ridge is considered to become parallel or nearly parallel to the longitudinal axis of petal. The direction of ridges is often disturbed in the epidermal cell from the upper part of petal. It is probable that the disturbance is ascribed to the effects of a marginal growth which is thought to be more active in the upper part than in the lower part of petal. Furthermore the disturbance seems to be caused by the fact that the aerial wall of upper epidermal cell has a tendency to become convex.

In *Rh. japonicum*, epidermal cells surrounding a base of long hair show often radial ridges from the base, without regard to the direction of the longitudinal axis of petal. Rapid elongation of the hair may accelerate an extention of the epidermal cell wall towards the base of hair, and then the ridge may become radial.

A single ridge of a cell was often found to make a straight advance into the adjacent cell. This fact shows probably that the ridges become out before the cell division at least.

The 2 related species, *Rh. macrosepalum* and *Rh. ripense*, show no or a few ridges in the epidermal cells from lower part of petal. This fact may be thought as characteristic for distinguishing the 2 species from the others.

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摘　要

ツツジ属7種の花冠上側花弁の表皮細胞をもちいて，その表面膜の様子が観察された。

レンゲツツジ，アケボノツツジ，コバノミツバツツジ，ヤマツツジおよびアズマシャクナゲでは細い線状隆起(畝)がみられる。しかしキシツツジとモチツツジの花弁下部からの細胞には線状隆起がみられないか，またはその発達がわるい。すべての種で線状隆起の方向は，花弁下部の細胞では花弁の縦軸の方向と一致するが，花弁上部の細胞では，その方向が乱れる傾向がある。

レンゲツツジでは線状隆起の数が他種より多いように思われる。なお単細胞毛の基部をかこむ表皮細胞では，その線状隆起は花弁の縦軸の方向とは関係なく，毛の基部から放射状に出る傾向がみとめられた。

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