On The Natural Pigments of Row Silk Fibre of The Domestic Cocoon (Part VI).

Fading of the Yellow Cocoon.

By

Masami OKU

(From the Chemical Laboratory of Gunze Raw Silk
Mfg. Co. Ltd., Ayabe-mati, Kyoto-hu, Japan.)

(Received March 27, 1933.)

Yellow cocoons are faded by the drying process and during their storage. They have, on the other hand, characteristic stimulant odor, so-called "yellow cocoons' odor". The cause of these facts was searched and verified it as resulting from the oxidation of xanthophyll, which is the main yellow pigment of the yellow cocoons.

Experimental.

(1) Oxidation of xanthophyll.

When lutein ($C_{40}H_{56}O_2$) (m. p. 193°) of the yellow cocoon was exposed to the current of oxygen, its yellow tinge was faded and increased in weight gradually, combining with oxygen atom. After 90 days exposure, it was increased in weight by 35% and a composition of $C_{40}H_{56}O_{13}$, melting near about 90° . This oxidized lutein showed no more absorption spectrum as is characteristic to xanthophyll.

(2) Fading during storage.

Yellow cocoons showed no remarkable fading during storage in carbon dioxide atmosphere even after 150 days, while these showed as much as 13 % fading in oxygen atmosphere after the elapse of the same days.

(3) Fading by drying process.

When fresh yellow cocoons were dried for 4 hours at 70° , they lost the yellow tinge as much as 13%.

(4) Presence of xanthophyll on the way of oxidation.

The natural yellow pigments present in the mother liquor of crystalline lutein showed the average composition of $C_{40}H_{56}O_6 \sim O_7$, which deemed me the substance was xanthophyll on the way of oxidation.

(5) "Yellow cocoons' odor".

Xanthophylls both on the way of oxidation and after being utterly oxidized have a violet-like odor, peculiar to the yellow cocoon. Depression of the melting point and increase in volatility by the oxidation of xanthophyll elucidate its smelling power greatly.