黄浮蚕幼虫の黄色色素について

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Characterization of a yellow pigment from a mutant *Kiuki* of silkworm, *Bombyx mori*

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松田利夫・津末玄夫・坂手栄：
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A natural mutant *Kiuki* has been preserved in the Sericultural Experiment Station for several decades. This mutant has a high viability and can easily be reared. The name of the mutant was derived from the yellow color of its larve. The yellow tone of the larval integument tends to become deeper after every molting. Nothing has been reported about the characteristic of the yellow pigment of the mutant. As for a mutant *lemon*, another yellow mutant of silkworm, two yellow pigments were detected and named xanthopterin-B_1 and B_2 respectively (ARUGA *et al.*, 1954). TSUSUE and AKINO (1965) isolated these pigments from integuments of mutant *lemon* and identified the major component, xanthopterin-B_1, with sepiapterin, 2-amino-4-hydroxy-7, 8-dihydro-6-lactylpteridine. The chemical structure of the minor component, xanthopterin-B_2, was established to be 7, 8-dihydro-2, 4-dihydroxy-6-lactylpteridine (GOTO *et al.*, 1966). In the present study the yellow pigment was isolated from the integuments of a mutant *Kiuki*, and some properties of the pigment are presented. 7, 8-dihydro-2, 4-dihydroxy-6-lactylpteridine was proposed for the structure of the pigment. Although the pigment has been called xanthopterin-B_2, now we call the pigment sepialumazine since the substance is a corresponding lumazine of sepiapterin.

The larval integuments of *Kiuki* were homogenized in Warling blender with 5 volumes of water. The homogenate was heated in a boiling waterbath for 20 minutes and then centrifuged. The supernatant was concentrated to a small bulk. The extracted pigment was purified by successive column chromatography systems of Florisil, ECTEOLA-cellulose (pH 7.0), phosphorylated-cellulose and Sephadex G-10. These columns were eluted with water. The final eluate was concentrated to dryness by a rotary evaporator.

The yellow pigment thus obtained gave a single greenish yellow fluorescent spot on paper chromatogram. The Rf values are shown in Table 1. As seen in the table the pigment shows the same Rf values as authentic sepialumazine (TSUSUE, 1971) with various solvents. The ultraviolet absorption spectra of the pigment are

Table 1. Rf values of yellow pigments

Substance	Paper chromatography solvents							
	1	2	3	4	5	6	7	8
Yellow pigment from *Kiuki*	0.40	0.41	0.68	0.15	0.32	0.22	0.56	0.54
Sepialumazine	0.41	0.41	0.69	0.15	0.33	0.22	0.55	0.54
Sepiapterin	0.44	0.36	0.53	0.26	0.42	0.28	0.61	0.31

Solvent system:
1 ; *n*-butanol, acetic acid, water (4:1:2, v/v)
2 ; *n*-propanol, 1% ammonia (2:1)
3 ; *n*-propanol, 1% ammonia (1:1)
4 ; *n*-propanol, ethylacetate, water (7:1:2)
5 ; *iso*-propanol, water (7:3)
6 ; 95% ethanol, *n*-amylalcohol, water (7:5:3)
7 ; *n*-propanol, 2% ammonium acetate (1:1)
8 ; 3% ammonium chloride

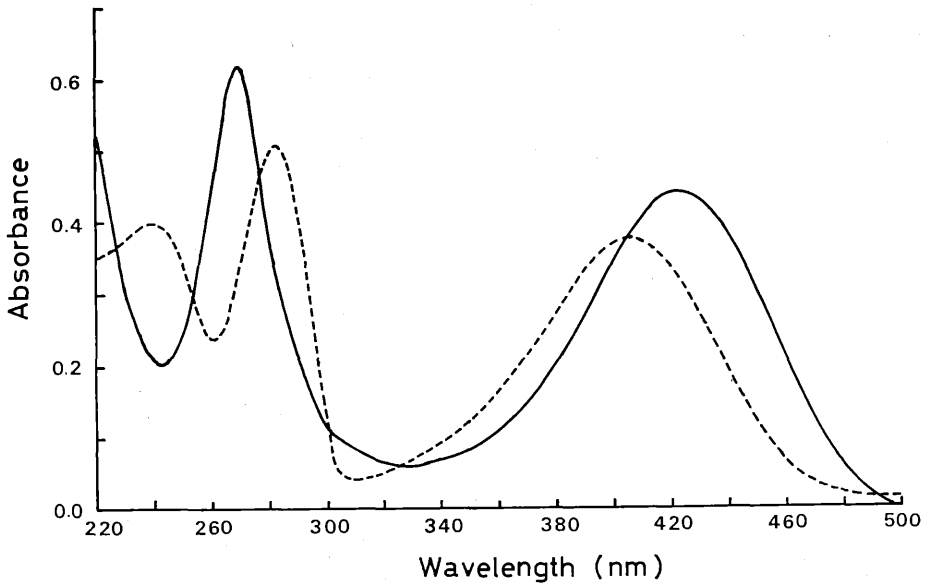

Fig. 1. Ultraviolet absorption spectra of the yellow pigment isolated from *Kiuki*. (——) in 0.1 N NaOH; (- - -) in 0.1 N HCl.

shown in Fig. 1, which coincide with those of sepialumazine. Based on these data, the pigment is tentatively identified as sepialumazine. Concerning sepialumazine, no study has been reported except for that from the mutant *lemon* of silkworm. In the latter mutant, sepiapterin is the major yellow pigment and sepialumazine is only a minor component. On the other hand, sepialumazine is the major pigment and sepiapterin could not be detected in the mutant *Kiuki*. Biological meaning of sepialumazine is not yet exactly known. Further studies on the pigment is now being undertaken in our laboratory.

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