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Effects of Various Photoperiods on Color and Pubescence in *Thyanta Pallidovirens Accerra* (Hemiptera: Pentatomidae)

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EFFECTS OF VARIOUS PHOTOPERIODS ON COLOR AND PUBESCENCE IN *THYANTA PALLIDOVIRENS ACCERRA* (HEMIPTERA: PENTATOMIDAE)[1]

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ABSTRACT

The effects of a range of developmental photoperiods on adult dimorphism in *Thyanta pallidovirens accerra* were studied under laboratory conditions. Adults reared in photophases of 14L and higher had short pubescence and those in 12L and lower, long pubescence. No dimorphism in color was produced in these same photophases.

Thyanta pallidovirens accerra McAtee ranges from New York south to Georgia, and west to Idaho, northeastern Utah, northeastern New Mexico, and Texas (Ruckes, 1957). Ruckes (1957) believed it, *T. calceata* (Say) and *T. custator* (Fabricius) had "an autumnal-vernal (overwintering) generation that differs in appearance from the summer brood. This seems to be a case of seasonal dimorphism. . ." The autumnal-vernal adults were brown with long seta-like hairs and summer adults, green with short hairs (less than diameter of tibia).

McPherson (1977a) confirmed Ruckes' hypothesis that *calceata* is seasonally dimorphic, that (1977b, 1978a) the morphs result from developmental photoperiod influence, and that (1978b) a threshold photoperiod of about 12.5L:11.5D (light: dark) is involved in the dimorphic response. Animals reared in photophases above and below the threshold develop into green adults with short pubescence and brown adults with long pubescence, respectively.

T. pallidovirens accerra, as noted above, is also apparently seasonally dimorphic; if so, it may also result from photoperiod influence. The results of an experiment to determine the role of photoperiod in producing adult dimorphism in this subspecies are presented here.

METHODS AND MATERIALS

A male and female of *pallidovirens accerra* were collected during September, 1977, in Jackson County in Southern Illinois. From their offspring, 18 males and females were selected as parents and placed in an incubator (23.9 ±| 1.1°C) under an 18L:6D photoperiod. They were mantained in mason jars (nine of each sex/jar) provided with cheesecloth as an oviposition site, filter paper and paper toweling strips, and fed green snap beans (*Phaseolus vulgaris* L.) as described by McPherson (1971).

Each resulting egg cluster was placed in one of the following six photoperiods and the animals reared to adults as described by McPherson (1971): 8L:16D, 10L:14D, 12L:12D, 14L:10D, 16L:8D, and 18L:6D. All experiments were conducted at 23.9 + 1.1°C during the light and dark phases, and about 130 ft-c during the light phases (Ken-Rad, 15W Daylight, F15T8/D).

Adult characters chosen for comparison were color (green or brown) and pubescence (longer or shorter than diameter of tibia). Adults were compared in sequential pairs of increasing photophase and the differences tested with the Fisher exact probability test. The 0.01 level of significance was chosen because of the variable and subjective nature of color.

RESULTS AND DISCUSSION

The success in rearing this subspecies on green beans was poor and thus, results from different photoperiods were combined to insure adequate numbers for statistical compari-

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sons. Since the threshold for the dimorphic response in *calceata* was near 12.5L:11.5D (McPherson, 1978b), I combined the results into the following three photoperiod groups: 8L:16D and 10L:14D; 12L:12D; and 14L:10D, 16L:8D, and 18L:6D (Table 1).

Photophases above 12.5L did not (unlike *calceata*) produce a significant number of green adult males and females; most were light to dark brown (males, 74.5-78.7%; females, 87.5%) as were those in the lower photophases (males, 72.2-95.8%; females, 63.6-94.7%) (Table 1). However, both sexes showed a significant switch between 12L:12D and 14L:10D from long to short pubescence, similar to *calceata*.

It is difficult to suggest, from the limited data, why this range of photoperiods did not produce adult color dimorphism in *pallidovirens accerra* as it did in *calceata* (McPherson, 1978b). It is possible that an additional variable is involved in adult color production in this subspecies (e.g., temperature, humidity), or that differential mortality occurred in which most potentially green adults died. Further studies should be conducted using a laboratory culture established with a larger field sample.

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Table 1. Comparison of color and pubescence between *Thyanta pallidovirens accerra* adults reared in various photoperiods.

		Color						Pubescence		
		Dorsal			Ventral					
Photoperiod	Sex	Brown	Green	Prob.[a]	Brown	Green	Prob.[a]	Short	Long	Prob.[a]
8L:16D[b]	♂	23	1		22	2		0	24	
12L:12D	♂	14	4	0.10	13	5	0.11	1	17	0.43
12L:12D	♂	14	4		13	5		1	17	
14L:10D[c]	♂	37	0	0.67	35	12	0.69	41	6	0.00
8L:16D[b]	♀	18	1		17	2		0	19	
12L:12D	♀	7	4	0.04	7	4	0.11	0	11	1.00
12L:12D	♀	7	4		7	4		0	11	
14L:10D[c]	♀	14	2	0.15	14	2	0.15	16	0	0.00

[a]Fisher exact probability test.
[b]8L:16D + 10L:14D.
[c]14L:10D + 16L:8D + 18L:6D.

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