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THE APPEARANCE AND DISAPPEARANCE OF TELOPODAL GLANDS DURING THE DEVELOPMENT OF *LITHOBIUS MICROPS* (LITHOBIOMORPHA, LITHOBIIDAE).

J.G.E. Lewis* and P.C.S.Yeung

Taunton School, Taunton, Somerset TA2 6AD
*Address for correspondence: Manor Mill Farm, Halse, Taunton, Somerset, TA4 3AQ

INTRODUCTION

Blower (1952) examined several species of *Lithobius* and *Lamyctes* and reported the presence of telopodal glands opening on the inner, morphologically posterior face, of the four distal podomeres (femur, tibia, tarsus and metatarsus) of the last two pairs of legs. They produce a secretion which hardens on exposure, forming a material which is amber-coloured when seen in mass and is normally extruded as long sticky fibres resembling silk.

Eason (1964) stated that the telopodal glands are concentrated on the 14th and 15th legs in most British species but sometimes there are a few on the 12th and 13th and more rarely, on all other legs. The small pores of these glands are sometimes so numerous as to produce a cribiform appearance. In *Lithobius duboscqui* Brölemann (=*Lithobius microps* Meinert) the concentrations of pores are dense on 14th and 15th legs, less dense on 13th.

Changes in the distribution of teleopodal glands during development of *L. microps* are here described.

MATERIALS AND METHODS

Most of the specimens used in this study were collected on 17.xi.1987 in mixed deciduous woodland 1km north of Staple Fitzpaine, near Taunton, Somerset (Grid ref. ST 261 192). Litter and humus samples were collected and extracted using Tüllgren funnels. Both larval and post larval specimens were obtained. The specimens were mounted in Hoyer's mountant for examination. Additional larval material which had been collected in Champagne-de-Belair, France and Nismes and Crupet Belgium by Mr. R.D. Kime and identified by Dr. E.H. Eason was also examined. It was not always possible to count the pores accurately, due either to the orientation of the legs or to the longitudinal folding of the podomere cuticle which sometimes occurred. In some cases it was also difficult to distinguish between gland pores and the socket of a seta where the seta had been lost. Doubtful cases were not scored. Where scores differed between right and left sides, the higher figure was used.

Andersson's (1976) abbreviations for the stadia are adopted here: L for the larval stadia with numbers 0 (=foetus) and I-IV and PL for the post-larval stadia including adult stadia with the numbers 1 and up. The larval stadia are easy to distinguish using number of leg pairs (L1 with 7 pairs plus 1 pair of half developed legs and 2 very small

pairs of limb buds. Larva 2 with 8 pairs plus 2 pairs of limb buds. Larva 3 with 10 pairs plus 2 pairs of limb buds. Larva 4 with 12 pairs of legs and 3 pairs of limb buds). There is considerable overlap in the majority of characters of post-larval stadia in *L. microps* (Andersson, 1982) but it was assumed that specimens with 1, 1, 1, 1 coxal pores were post larval stadium 1 and that specimens with a head length greater than 0.70mm were adult as was the case in Andersson's Swedish material.

RESULTS

Fourteen specimens were examined in detail, 5 from France and Belgium and 9 from Somerset. No larva I were present in the collections. The results for one of each of larvae II, III and IV, post larval 1 and an adult male and female from the Somerset material are shown in Tables 1, 2 and 3. Table 1 shows the numbers of telopodal gland pores on the femora, Table 2 the tibia and Table 3 the tarsus. The data for the continental specimens are similar. No individuals of larva I were present in the collections. In LII the last pair of legs (the 8th) have telopodal gland pores on tibia and tarsus. In LIII pores are present on the last pair of legs (the 10th) and on the 8th but the latter are smaller and darker, presumably regressing. In LIV pores are present on the last pair of legs (the 12th) and on the 10th, where they are smaller and darker, but have disappeard on the 8th. In PL1 pores are present on the last 2 pairs of legs (14th and 15th) and regressing on the 12th. In mature specimens pores are present on the 13th, 14th and 15th pairs of legs, the condition described by Eason (1964). Pores could not be identified on the 12th with certainty. The femur, tibia and tarsus of the more anterior legs bear a few small pore-like structures, the exact nature of which is not clear.

Table 1. Number of telopodal gland pores on femur of legs 6-15 successive stadia of *L. microps*.

STADIUM	LII	LIII	LIV	PL1	ADULT	
					MALE	FEMALE
LEG 6	0	0	0	0	0	0
7	0	0	0	0	0	0
8	0	0	0	0	0	0
9		0	0	0	0	0
10		8	6	0	0	0
11			0	0	0	0
12			13	8	0	0
13				0	0	0
14				15	35	48
15				22	102	55

Table 2. Number of telopodal gland pores on tibia of legs 6-15 of successive stadia of *L. microps*.

STADIUM	LII	LIII	LIV	PL1	ADULT	
					MALE	FEMALE
LEG 6	0	0	0	0	0	0
7	0	0	0	0	0	0
8	14	11	0	0	0	0
9		0	0	0	0	0
10		24	22	0	0	0
11			0	0	0	0
12			29	26	0	0
13				0	23	14
14				25	87	74
15				31	111	68

Table 3. Number of telopodal gland pores on tarsus of legs 6-15 of successive stadia of *L. microps*.

STADIUM	LII	LIII	LIV	PL1	ADULT	
					MALE	FEMALE
LEG 6	0	0	0	0	0	0
7	0	0	0	0	0	0
8	15	11	0	0	0	0
9		0	0	0	0	0
10		31	16	0	0	0
11			0	0	0	0
12			30	16	0	0
13				0	22	20
14	TARSUS			24	71	79
	METATARSUS			11	20	29
15	TARSUS			25	115	75
	METATARSUS			16	46	27

DISCUSSION

During the anamorphic phase of development in *L. microps* each new pair of legs bears telopodal glands whilst those on more anterior, previously terminal legs gradually disappear. We have no knowledge of the condition in LI but since it is of very short duration and since there are no pores on the 7th pair in LII it seems likely that they are absent. The pattern differs in the post-larval, epimorphic stadia. In PL1 the last 2 pairs of legs bear glands, whilst in the adults the last 3 pairs do so. There is presumably an anterior/posterior gradient along the trunk which brings about the development of telopodal glands on more posterior legs and causes their regression on more anterior legs producing an apparent programmed death of gland cells.

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