

DISPLACEMENT OF THE MALE SECONDARY SEXUAL CHARACTERS IN LITHOBIUS CALCARATUS C L KOCH AND OTHER SPECIES OF LITHOBIUS

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Matic (1961) described a new species of Lithobius from Italy, L. lanzai based on a single male of L. calcaratus with the right 15th and left 14th legs missing but a femoral wart on the right 14th leg (Fig 1). Matic believed this to represent a new species characterised by femoral warts on both 14th and 15th legs and failed to recognise it as a damaged specimen of L. calcaratus which normally has warts only on the 15th. Among the 22 male type specimens of L. calcaratus (Eason 1972: 109) was one with both 15th and the left 14th legs missing but with a femoral wart on the right 14th (Fig 2). A regenerated 15th leg is sometimes found in males of L. calcaratus without any modification of the corresponding 14th, so it seems that if the 15th is lost, probably at an early stage of post-larval development, it is regenerated but at a later stage or under certain other circumstances, instead of regeneration the wart appears on the corresponding 14th leg. Most specimens found without one or both 15th legs have no modification of the corresponding 14th, presumably because the leg was lost too late in the course of development for the animal to be able to acquire a 14th femoral wart or because it was collected before it had time to do so.

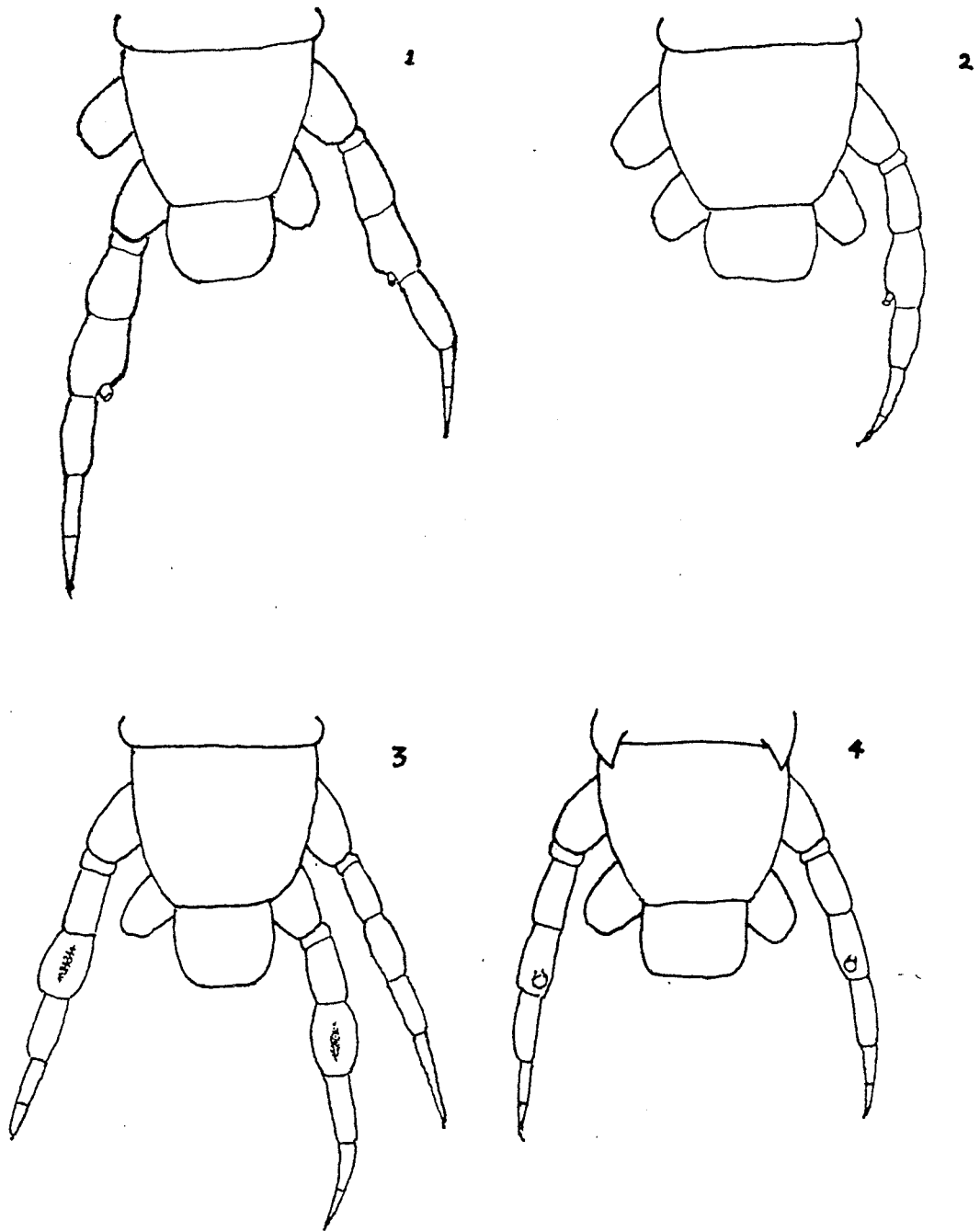
A similar phenomenon seems to occur in Lithobius martensi: Eason from Nepal which has a broad dorsal sulcus on the male 15th femur (Eason 1989). Among the 35 male type specimens of this species one, as well as having the usual sulcus on the right 15th femur, has a similar sulcus on the left 14th, the left 15th leg being missing (Fig 3). However, males of L. martensi sometimes have a very faint 14th dorsal femoral sulcus in intact specimens so that this anterior displacement of the secondary sex character is less obvious than it is in L. calcaratus.

Chamberlin (1925) named the genus Kesubius to receive a species, K. syntheticus, from Uruguay with what he described as 'lobes' on the 14th femora which he believed to constitute a generic character. The single male on which this species was based had both 15th legs missing but in all respects resembled a male of the common Mediterranean Lithobius obscurus. Meinert in which the femoral processes, normally present on the 15th legs, had shifted to the 14th (Fig 4). This species has been introduced to many parts of the world and has been found in most of the maritime states of South America including Uruguay (Eason 1992). Since indigenous Lithobiidae are almost unknown in South America it is likely, if not certain, that K. syntheticus was based on a damaged male of L. obscurus (Eason 1974: 19) which had undergone the same anterior displacement of the sex characters as in L. calcaratus.

A number of interesting questions now arise:

What happens when both 14th and 15th legs are lost on the same side? Does the character then appear on the 13th?

Does the same displacement occur in species such as Lithobius curtipes C L Koch in which the male sex character is found, not on the femur but on the tibia?



Figs 1-4 14th and intermediate tergites of male with 14th and 15th legs, dorsal view, semi-diagrammatic.

1. Lithobius lanzai Matic = calcaratus C L Koch, after Matic (1961)
2. Lithobius calcaratus C L Koch, one of Koch's type specimens
3. Lithobius martensi Eason, a type specimen
4. Kesubius syntheticus Chamberlin = Lithobius obscurus Meinert, from Chamberlin's (1925) description

In species such as Lithobius muticus C L Koch in which the character is found on the 14th leg, would loss of this leg result in the character appearing on the 13th or 15th?

What happens if one of the posterior legs is lost in a species in which male sex characters occur normally on the 14th and 15th legs, or in the few such as the common European Lithobius mutabilis L Koch in which they occur on the 13th, 14th and 15th?

Are there any factors, other than the stage of development at which the 15th legs are lost, which influence this phenomenon?

Detachment of legs in Lithobius usually occurs between the coxa and trochanter. Loss of the character by detachment at other articulations is likely to have the same effect although this has never been observed.

Most candidates for this phenomenon are foreign species but anyone in Britain with a large collection of Lithobius calcaratus could look through the specimens to see if there are any which have undergone anterior displacement of the sex characters, and similarly with L. curtipes and L. muticus. Breeding experiments involving the detachment of legs in the different stadia would produce interesting results.

Lewis (1981) suggested that male secondary sex characters in the Lithobiidae are associated with sex pheromones and they must certainly have some sexual function, probably enabling the female to recognise a male of the same species. However this may be they must be of vital importance for the animal to be so determined to keep them on both sides despite losing the leg on which they are normally borne. Their appearance on an abnormal leg must take place at a time of moulting and is presumably under some sort of hormonal influence. I have discussed this phenomenon with several European myriapodologists, some of whom say they have also noticed it, but nothing has been published about it as far as I know.

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