

Teratological variation in *Chthonius ischnocheles* (Hermann)
and *C. aff. tetrachelatus* (Preyssler) (Chthoniidae,
Pseudoscorpiones)

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Introduction

It is not uncommon to find pseudoscorpions suffering from one or more morphological disorders. Aberrations may be produced internally and externally, the latter being induced mechanically, physically or chemically (Legg and Jones 1988). Internally induced aberrations occur during development and moulting. These malformations were first noted by With (1905), Kästner (1927) and Hadži (1930), and later classified by Pedder (1965) and Ćurčić *et al.* (1983). More recently, Ćurčić (1980), Ćurčić and Dimitrijević (1982, 1985, 1986, 1988) and Dimitrijević (1990) have provided further examples and attempted to quantify the phenomenon.

The cheliferid species *Dactylochelifer latreillei* (Leach) shows a high incidence of teratological aberrations in all stages except protonymphs. In some other species, inhabiting Great Britain, Pedder (1960) found that the abnormalities were confined to the last tritonymph/adult (maturation) moult ('post-embryonic moult phenomena'). In different representatives of the Neobisiidae, and particularly in *N. carpaticum* Beier, *N. fuscimanum* (C. L. Koch), *N. cephalonicum* (Daday), *N. macrodactylum* (Daday), *N. sylvaticum* (C. L. Koch) and *Roncus lubricus* L. Koch, Ćurčić (1980) and Ćurčić and Dimitrijević (1982, 1986, 1988) established a teratological incidence of 0.68-2.00 % out of more than 9,000 specimens examined; and in *N. simoni* (L. Koch) and *N. bernardi* Vachon, the incidence was 1.76-2.45 %, depending on the species and locality (Dimitrijević 1990).

Among the chthoniid species, only two examples of segmental anomalies in *Chthonius ischnocheles* (Hermann) have been noted (Ćurčić and Dimitrijević 1987). Rare aberrations in morphological structures were also observed in *C. tenuis* (L. Koch) (Ćurčić 1989, Dimitrijević 1990).

The aim of this paper is twofold: (i) to quantify an

the genus *Chthonius* C. L. Koch, *C. ischnocheles* and *C. (Ephippiochthonius) aff. tetrachelatus* (Preysslner) and (ii) to discuss the possible causes that spark the origin of such malformations in the pseudoscorpions studied.

Material and methods

Samples of *C. ischnocheles* and *C. aff. tetrachelatus* were obtained by one of us (RND) in Moulis and Passarole in southern France, over a period running from May to September 1987. The pseudoscorpions were collected by sifting leaf-litter and humus in oak forests.

After dissecting, all specimens have been mounted in the gum chloral medium and thoroughly examined. The terminology for the segmental anomalies in this study is the same used for other arthropods (Balazuc 1948), but somewhat modified by Ćurčić et al. (1983) and Ćurčić and Dimitrijević (1986).

Results

A total of 45 aberrant specimens of *C. ischnocheles* were found (Tables 1 and 2)(44 in Passarole and one specimen in Moulis), while no abnormal specimens of *C. aff. tetrachelatus* have been observed at all.

Table 1 The number of specimens of *Chthonius ischnocheles* and *C. aff. tetrachelatus* (including different sexes and growth stages), collected from various sites.

Species	Locality	Sex/instar					Total
		M	F	T	D	P	
<i>C. ischnocheles</i>	MO	133	14	10	3	-	160
<i>C. ischnocheles</i>	PA	183	132	90	23	-	428
<i>C. aff. tetrachelatus</i>	MO	125	39	2	-	-	166
<i>C. aff. tetrachelatus</i>	PA	-	-	-	-	-	-
	Total	441	185	102	26	-	754

Abbreviations: M - males, F - females, T - tritonymphs, D - deutonymphs, P - protonymphs. MO = Moulis, PA = Passarole.

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SUMMARY

An attempt has been made to quantify and qualify teratological variation in two sympatric species of Chthonius C. L. Koch, C. (C.) ischnocheles (Hermann) and C. (Ephippiochthonius) aff. tetrachelatus (Preyssler), from southern France.

A total of 45 aberrant specimens of C. ischnocheles have been found (out of 588 specimens collected), while no abnormal examples have been observed in the sample of C. aff. tetrachelatus.

In C. ischnocheles, the following aberrations were noted: partial atrophy, symphysomery, combined atrophy and sclerite enlargement, combined atrophy and symphysomery and combined helicomery and symphysomery. The percentage of anomalies of abdominal sclerites in this species varies from 0.62 - 10.28 %, depending on the growth stage, sex or collecting site. Symphysomery accounts for more than 90 % of the total number of abdominal malformations. Aberrations were confined mainly to adults (males).

In C. ischnocheles, the frequency of abdominal anomalies is different from the same feature in the species of the genera Neobisium Chamberlin and Roncus L. Koch.

It is assumed that genetic factors strongly influence the development of abdominal anomalies, probably during the period of metamerisation.