

A Case of Abnormality in Presence of Coxal Pores in Lithobiomorpha (Chilopoda)

Ivan Hadrián Tuf^{1*} & László Dányi²

¹Department of Ecology and Environmental Sciences, Faculty of Science, Palacký University, Šlechtitelů 27, CZ-77900 Olomouc, Czech Republic. E-mail: ivan.tuf@upol.cz

²Department of Zoology, Hungarian Natural History Museum, Baross u. 13, H-1088 Budapest, Hungary. E-mail: laszlodanyi@gmail.com

Abstract: A case of abnormal distribution of coxal pores of *Lithobius sibiricus* is described. An additional single pore is situated on one of the 11th coxae.

Introduction

The pattern of distribution of coxal pores, i.e. openings of the probably multifunctional glandular coxal organs (ROSENBERG & BAJORAT 1984, LITTLEWOOD & BLOWER 1987), is a strong taxonomical character in the Lithobiomorpha (BONATO et al. 2010). Although the number of these pores is increasing during the post-larval development and intraspecific variability might affect their number (MURAKAMI 1960, ANDERSSON 1976), their presence or absence on certain legs is very stable. This taxonomic character is used even at the subfamily level within the family Lithobiidae, where only members of the subfamily Pseudolithobiinae Matic, 1973 (one species in *Ottobius* Chamberlin, 1952 and two in *Pseudolithobius* Stuxberg, 1875) have coxal pores also on the 11th coxae in addition to those on the 12-15th (ZAPPAROLI & EDGECOMBE 2011).

Several papers have reported abnormal specimens in the Lithobiomorpha (e.g. BOREK 1969, DEMANGE 1971, GARCIA RUIZ 2006), including also some reports on cases with unusual arrangement of coxal pores on the last four pairs of coxae (MATIC 1981, LEWIS 1987, 1989, 1990). Nevertheless, there has been only one note about the presence of pores on coxa of 11th pair of legs till now: MATIC (1958) documented a male of *Lithobius forficatus* (L., 1758) with coxal pores pattern formula 4, 8, 7, 8, 6 (right side)

and 0, 9, 9, 9, 6 (left side). In this communication, we report another case of abnormality in the distribution of coxal pores observed in the family Lithobiidae.

Materials and Methods

Evaluating a material of centipedes collected in Mongolia, we found another specimen with an abnormal arrangement of coxal pores. The specimen is a male of *Lithobius sibiricus* Gerstfeld, 1858 collected via singling at the field station of the Mongolian National University from a *Picea sibirica* wood on a slope with northern exposition (47°46'00.37" N, 106°53'10.52" E, 1550 m a.s.l.) by I. H. Tuf on 10 June 2016. The specimen is currently deposited in the Soil Zoology Collection of the Hungarian Natural History Museum, Budapest, Hungary.

Results and Discussion

The abnormal specimen of *Lithobius sibiricus* had one pore situated on one of the 11th coxae (Fig. 1).

For the number of coxal pores on the last four pairs of legs in *L. sibiricus*, EASON (1976) mentioned 6, 7, 7, 7, while LOKSA (1965) documented 6, 6, 6, 6 for *Lithobius anornatus*, and it is typically varying between five to eight per coxa (ZALESSKAJA 1978).

*Corresponding author

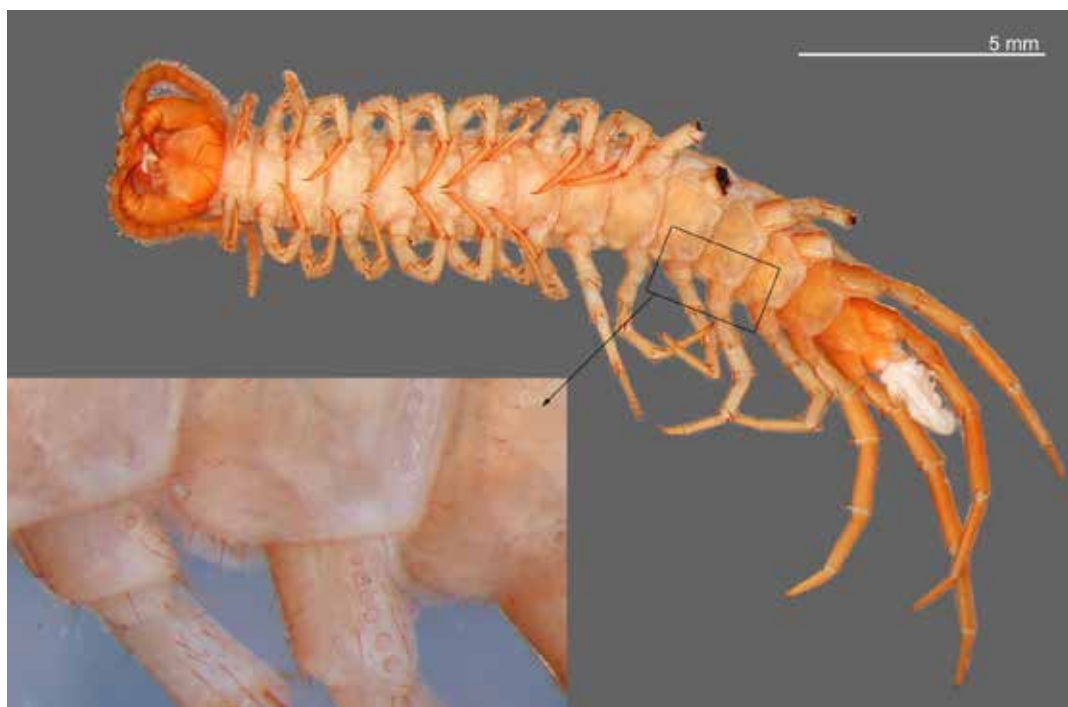


Fig 1. *Lithobius sibiricus* with abnormal coxal pore: habitus (ventral view) and detail with 11-12th coxae.

The examined specimen had the following coxal pores formula on legs 11-15th: 1, 6, 7, 7, 4 (right side) and 0, 6, 7, 7, 5 (left side). There were no other abnormalities in the specimen, although the 13th left leg had been lost during its capturing and the 10-12th left legs had been partially detached at an earlier event (probably a predatory attack) in the specimen's life. According to Fründ's experiments on centipede scars (FRÜND 1992), the darkly scabbed cicatrised lesions of these latter legs proved that these injuries had been acquired well before the collecting of the specimen, but after its last moulting. Assuming that there were no other damages on the same legs already, also before the predatory attack, i.e. before the last moulting, we can consider that these injuries had

not affected the development of the coxal pores on the other legs. Indeed, it is a known phenomenon in Lithobiomorpha that losing some of the last pairs of legs might affect the appearance of secondary sexual characters on some of the remaining legs in unusual positions (EASON 1993). There are no records of a similar effect regarding the coxal pores and these changes can be established only during the subsequent moultings of the specimen.

Although the identification of our specimen is doubtless, there have been several cases when symmetrical (or unrecognised asymmetrical) abnormalities led to its wrong taxonomical evaluations and descriptions of new lithobiomorph taxa (CRABILL 1981, EASON 1993).

References

- ANDERSSON G. 1976. Post-embryonic development of *Lithobius forficatus* (L.), (Chilopoda: Lithobiidae). *Entomologica Scandinavica* 7: 161-168.
- BONATO L., EDGECOMBE G. D., LEWIS J. G. E., MINELLI A., PEREIRA L. A., SHELLY R. M. & ZAPPAROLI M. 2010. A common terminology for the external anatomy of centipedes (Chilopoda). *Zookeys* 69: 17-51.
- BOREK V. 1969. Fund eines Gynandromorphs von *Monotarso-bius austriacus* Verhoeff, 1937 (Chilopoda). *Acta Musei Reginaehradecensis, Serie A* 10: 33-34. (In Czech, with German summary).
- CRABILL R. E. JR. 1981. Synonymy by way of teratology (Chilopoda: Lithobiomorpha: Lithobiidae). *Proceedings of the Entomological Society of Washington* 83: 359.
- DEMANGE J.-M. 1971. Deux cas tératologiques chez les myriapodes. *Bulletin de la Société d'histoire naturelle de Toulouse* 107: 460-467.
- EASON E. H. 1976. The type specimens and identity of the Siberian species described in the genus *Lithobius* by Anton Stuxberg in 1876 (Chilopoda: Lithobiomorpha). *Zoological Journal of the Linnaean Society* 58: 91-127.
- EASON E. H. 1993. Displacement of the male secondary sexual characters in *Lithobius calcaratus* C. L. Koch and other species of *Lithobius*. *Bulletin of the British Myriapod Group* 9: 21-24.
- FRÜND H. C. 1992. The occurrence and frequency of scars in centipedes. *Berichte des Naturwissenschaftlich-Medizinischen Vereins in Innsbruck, Supplement* 10: 269-275.

- GARCIA RUIZ A. 2006. Effects on a community of centipedes (Chilopoda) of cadmium accidentally released. Norwegian Journal of Entomology 53: 191-194.
- LEWIS J. G. E. 1987. On some structural abnormalities in Lithobius and Cryptops (Chilopoda) and their structural significance. Bulletin of the British Myriapod Group 4: 53-6.
- LEWIS J. G. E. 1989. Reduction in number of coxal pores in *Lithobius variegatus* Leach. Bulletin of the British Myriapod Group 6: 32-33.
- LEWIS J. G. E. 1990. Abnormalities in the coxal pores of *Lithobius variegatus* Leach. Bulletin of the British Myriapod Group 7: 41-42.
- LITTLEWOOD P. M. H. & BLOWER J. G. 1987. The chemosensory behaviour of *Lithobius forficatus*. 1. Evidence for a pheromone released by the coxal organs (Myriapoda: Chilopoda). Journal of Zoology 211: 65-82.
- LOKSA I. 1965. Zoologische Ergebnisse der Forschungen von Dr. Z. Kaszab in der Mongolei. 21. Chilopoda. Opuscula Zoologica, Budapest 5: 199-215.
- MATIC Z. 1958. Deux Lithobiides nouveaux pour la faune de la R.P.R. et quelques remarques intéressantes sur *Lithobius forficatus*. Studii și Cercetări de Biologie (Cluj) 9: 81-89 [in Romanian, with French summary].
- MATIC Z. 1981. Un intéressant cas tératologique chez l'espèce *Lithobius doriae* (Poc.), Lithobiomorpha – Chilopoda. – *Studia Universitatis Babeş-Bolyai, Seria Biologia*, 26: 13-14.
- MURAKAMI Y. 1960. Postembryonic development of the common Myriapoda of Japan. V: *Lithobius pachypedatus* Takakuwa (Chilopoda, Lithobiidae), 3. Variation in the number of articles of antennae and coxal pores. Zoological Magazine, Tokyo 69: 167-170 [in Japanese, with English abstract].
- ROSENBERG J. & BAJORAT K. H. 1984. Einfluß der Coxalorgane von *Lithobius forficatus* L. (Chilopoda) auf die Sorption von Wasserdampf. Zoologische Jahrbucher, Abteilung für allgemeine Zoologie und Physiologie der Tiere 88: 337-344.
- ZALESSKAJA N. T. 1977. [Adaptive morphological characters of stone centipede (Chilopoda, Lithobiomorpha)]. In: GHILAROV M. S. (Ed.): [The Adaptation of Soil Animals to Environmental Conditions]. Moscow: Nauka, pp. 55-60 [in Russian].
- ZAPPAROLI M., G. D. EDGECOMBE 2011. Lithobiomorpha. In: MINELLI A. (Ed.): Treatise on Zoology – Anatomy, Taxonomy, Biology. The Myriapoda, Vol. 1. Leiden-Boston: Brill, pp. 363–443.

Received: 05.12.2016

Accepted: 10.01.2017

