

Morphological variability of *Sejus togatus* (Acari: Mesostigmata: Sejina)

Dariusz J. Gwiazdowicz & Maria E. Gulvik

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Variability of selected morphological features was analyzed from 54 *Sejus togatus* females. The principle morphological features used in taxonomic studies to describe new species in the genus *Sejus*, and which are included in keys to determine species from this genus, were selected for the analysis. Defining new features for taxonomic studies of the genus *Sejus* are called for.

D. J. Gwiazdowicz, August Cieszkowski Agricultural University, Department of Forest Protection, Wojska Polskiego 71c, 60-625 Poznań, Poland; e-mail: dagwiazd@au.poznan.pl

M. E. Gulvik, Sogn og Fjordane University College, Faculty of Engineering and Science, P.O. Box 133, N-6851 Sogndal, Norway; e-mail: maria.gulvik@hisf.no

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1. Introduction

Sejus togatus C.L. Koch, 1836 is a species primarily inhabiting forest areas. The species is most frequently found in rotting wood and bark beetle galleries and somewhat less frequently in the litter (Hirschmann *et al.* 1991). However, Fenda and Cicekova (2005) reported this species frequently in forest litter. *S. togatus* individuals are relatively large in comparison to other mesostigmatid mite species, e.g. females are from 0.9 to 1.1 mm long. Moreover, if we take into account the characteristic structure of the idiosoma with bottle-shaped bases of Z5 setae, this species may be considered easy to identify even for a novice acarologist.

Unfortunately, this species, as other species of genus *Sejus*, is morphologically very variable (Gwiazdowicz 1995, 2000) and this variability may cause difficulties in determination of the species.

Hirschmann *et al.* (1991) revised the genus *Sejus* and suggested a set of features to enable the

species identification. Morphological features suggested for six species described from Europe included: length and width of the idiosoma and selected shields (genital, venrianal, pygidial), as well as the ratio of the length to the width of these shields and the number of setae on the selected shields.

Assuming that the morphological features used for determining selected species are constant and unchangeable a decision was made to analyze the selected morphological features of *S. togatus* females. The results are used as the basis for the assessment of the suitability of these features for the identification of *Sejus* species.

2. Material and methods

The analysis involved 54 *S. togatus* females collected in 2000–2006 from the western border of Sogn og Fjordane in Norway (60°45'–61°45' N, 5°15'–7°45' E). This material belongs to the Sogn og Fjordane University College, Depart-

Table 1. Measurements of idiosoma, pygidial and ventrianal shields and number of setae on mesonotal shields 1–4 of *Sejus togatus* (N=54 females).

Morphological feature	Max	Min	Mean	Std
Length of idiosoma (μm)	1,100	890	1,015	49.86
Width of idiosoma (μm)	880	570	741	68.55
Length/width	1.56	1.23	1.37	0.08
Length of pygidial shield (μm)	270	220	245	12.09
Width of pygidial shield (μm)	390	310	356	15.80
Length/width	0.81	0.62	0.69	0.35
Length of ventrianal shield (μm)	320	240	284	18.86
Width of ventrianal shield (μm)	550	450	496	24.23
Length/width	0.69	0.49	0.57	0.04
No. of setae on genital shield	10	6	8	1.03
No. of setae on pygidial shield	27	16	22	2.71
No. of setae on mesonotal shield 1	7	3	5	1.09
No. of setae on mesonotal shield 2	8	3	5	0.97
No. of setae on mesonotal shield 3	5	1	3	0.96
No. of setae on mesonotal shield 4	5	1	3	0.78

ment of Natural Science and is deposited in the museum De Heibergske Samlinger (The Heiberg Collections, Vestreim, Kaupanger), Norway.

The lengths and widths of the idiosoma, pygidial shields and ventrianal shields were measured and the ratio of lengths to widths was calculated. The measurements were conducted with the accuracy of up to 10 μm , which is commonly accepted in acarological taxonomic studies. In addition, the setae on genital shields, four mesonotal shields and pygidial shields were counted. The position of Z3 seta was taken into consideration since according to Hirschman *et al.* (1991), the position of this seta on the pygidial shield, or outside of it, is a significant taxonomic character. The various types of shields located on the dorsal idiosoma are shown in Fig. 1.

3. Results and conclusion

There was significant individual variation in the majority of the characters analysed, for example idiosoma length and the ratio of idiosoma length/width (Table 1). However, there was somewhat less variability in the lengths of the pygidial and ventrianal shields. The number of setae on the genital shield displayed considerable variability (Table 1). From three to five setae were noted in the females examined. 24 females had paired setae and 20 females had unpaired setae. However, four pairs of setae was the most frequent condition (Table 1).

Setae st1 and st2, which are usually on separate presternal shields, were not examined since these characteristics were not treated as taxonom-

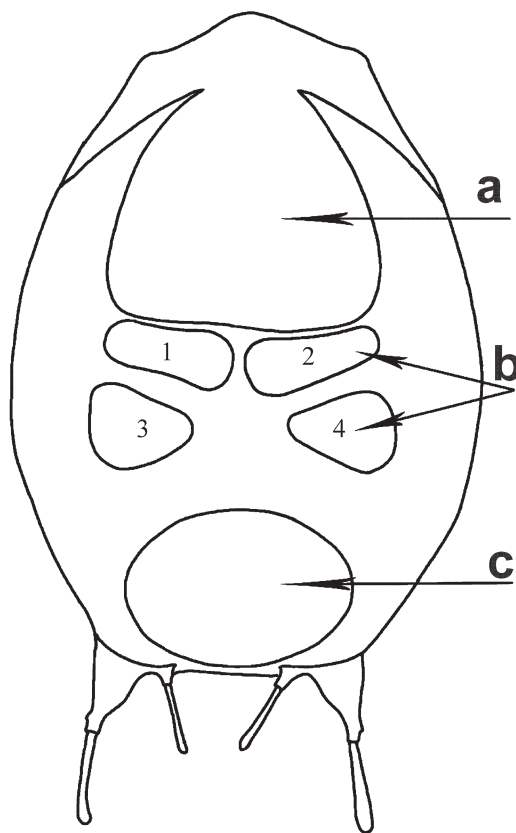


Fig. 1. Dorsal idiosoma of *Sejus* female. a: pronotal shield, b: mesonotal shields 1–4, c: pygidial shield.

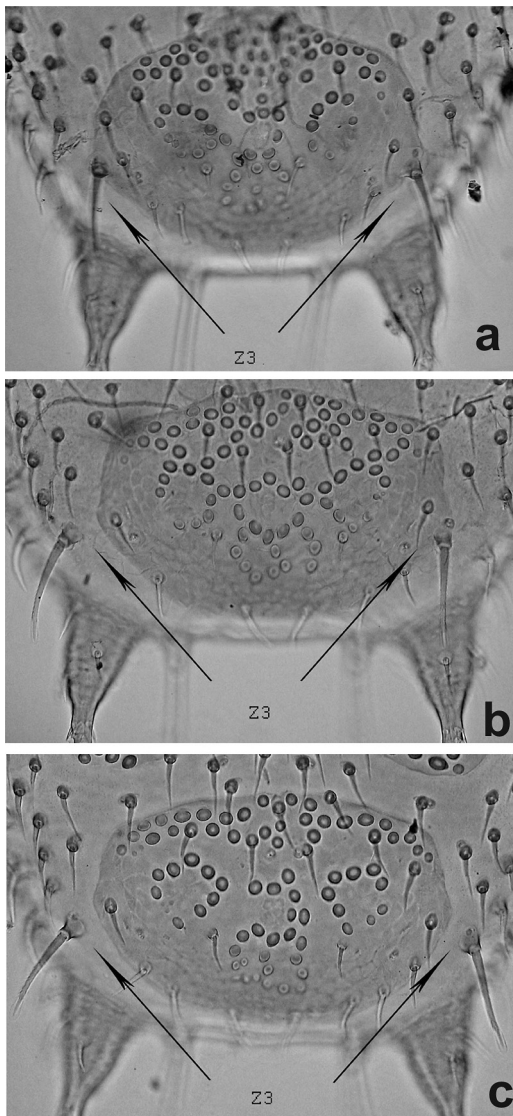


Fig. 2. Positions of seta Z3 of *Sejus togatus* females. – a. Two setae on pygidial shield; – b. Only one seta on pygidial shield; – c. Both setae outside of pygidial shield.

ically significant by Hirschmann *et al.* (1991). According to Bregetova (1977) the presence of these setae on presternal shields is also variable. Nonetheless, the number of setae on the pygidial shield was taken into consideration. The number of these setae ranged from 16 to 27 (Table 1). Z3 seta may be present on this shield but also outside

of it. In 19 females both Z3 setae were on the pygidial shield (Fig. 2a), in 18 females one Z3 seta was on the shield, and one outside of it (Fig. 2b), and in 17 females both Z3 setae were outside of the shield (Fig. 2c).

The number of setae present on the mesonotal shields (1–4, Fig. 1), which are typical for this species, was 3–8 on the upper shields (1 and 2) and 1–5 setae on the lower pair of shields (3 and 4) (Table 1).

In conclusion, *S. togatus* females display great morphological variability. Therefore, the morphological characters analysed in this study and which are currently used in taxonomic studies of *Sejus*, e.g. in describing new species, must be revised. The shape of particular shields, the ratio of their lengths to widths, the number of setae or the position of Z3 seta should not be the basic characters included in keys of *Sejus* species.

Defining new taxonomic features to precisely describe and determine mites of the genus *Sejus* will certainly be the primary task for the next revision of this genus.

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