JÖRG STUMPP & ANDRZEJ SZEPTYCKI

Eosentomon rusekianum sp. n., a new species of Protura (Arthropoda: Insecta) from South Germany

Kurzfassung
Eosentomon rusekianum sp. n. wurde im Boden eines Auwaldes (Fraxino-Ulmetum) bei Ulm-Wiblingen (Süddeutschland) entdeckt.

Abstract
Eosentomon rusekianum sp. n., an edaphic species of Protura was found in an alluvial forest association „Fraxino-Ulmetum" nearby Ulm-Wiblingen (South Germany, FRG).

Résumé
Eosentomon rusekianum sp. n., une espèce édaphique était découverte dans une forêt alluviale (Fraxino-Ulmetum) près d'Ulm-Wiblingen (Allemagne du Sud, RFA).

Authors
Dr. JÖRG STUMPP, Universität Ulm, Abt. Ökologie und Morphologie der Tiere, Oberer Eselsberg, D-7900 Ulm,
Prof. Dr. ANDRZEJ SZEPTYCKI, Zaklad Zoologii Systematycznej i Doświadczalnej PAN, ul. Slawkowska 17, PL-31-016 Kraków, Polska.

Diagnosis

By the sickle-like head of the female squama genitalis the new species is similar to *Eosentomon chischaensis* YIN, 1965, *E. romanum* NOSEK, 1969, *E. nivoculum* YIN, 1981, *E. jinhongense* YIN, 1982, and *E. mirabile* SZEPTYCKI, 1984. It is most similar to *E. mirabile* in the presence of six setae on urosternite IX and X, and in the shape and position of p1' on urotergite (T) VII as well as in the shape and position of p1'' on T VIII. Both species differ in the head chaetotaxy, the dimension of pseudoculus and in the shape of foretarsal sensilla f1.

Description

Body of typical Eosentomon-shape, short, only 700 µm of length. Length of head 94 to 99 µm; foretarsus without claw 70–75 µm.
Head setae short, subposterior and posterior of the same length. Anterior additional head setae present, posterior absent. Labral setae absent. Rostral setae alate, thicker than subrostral. Pseudoculus of great size (20 µm) with longitudinal line, PR 4,5–5,0. Lateral sensilla of maxillary palp thicker and slightly shorter than dorsal. Setae on nota short, p1 equal or shorter than p1' (the length of p1' is varying from 10 to 14 µm), p2' longer than p3'. Length ratio of p1:p1':p2 on mesonotum as 1.1:1:1.2. Tracheal camerae long and thin. Foretarsal sensilla a long, nearly reaching the base of γ 2; b the same length than c; d long; e equal or a little shorter than g, with spatulate dilatation about half of the sensilla length; f1 long and not dilated, but always shorter than e, t1 in the middle of line α3 and α3'; a' and b2' long, twice as long as c'; c' not dilated.
BS 0.9–1.0, TR 5.0–5.6, EU about 0.8 Basal seta of leg III long, of normal shape. Urotergites (T) IV–VII with 10,10,10,6 anterior setae; T VII with a1 and a3 lacking. p1' of T VII exceptionally long, surpassing by far the hind margin of tergite (apex of p1' slightly split). p1'' on T VIII very short with basal dilatation. Laterostigma II–IV large. Lateral sclerotization of urosternite VIII distinct, with hind margin connected with antecosta. Female squama genitalis short, head distinct and sickle-like.

Table 1. Abdominal chaetotaxy

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
t	4	10	10	10	10	10	6[2]	6	8	8	8	6
	12[1]	14	14	16	16	16	16	9				3
	4	6	6	6	6	6	6	7	6[3]	6	8	8
	4	4	4	10	10	10	10					4

[1]) p3 small sensilla; [2]) a1, a3 missing; [3]) asymmetrical lack of the middle seta was observed; t = tergite; s = sternite.

Locus typicus
The specimens had been found in soil samples of an alluvial forest (Fraxino-Ulmetum) near Ulm (Wiblingen, Federal Republic of Germany), taken on 11 4. 1988; pH-value at sampling time: 7.4 (KCl-method).

Material
Nine males, five females and three maturi juniores. – Holotype Au 11. 4. 88 69 1, 10; seven paratypes Au 11. 4. 88, 1 = S 2,5, 2 = 36 2,7, 3 = 36 2,10, 4 = 36 2,14, 5 = 69 2,13, 6 = 912 2,1, 7 = 912 2,2. Holotype and six paratypes in the collection of the Museum „Landessammlungen für Naturkunde Karlsruhe"

Name derivation
The new species is named in honour of Dr J. RUSEK, leader of the Institute of Soil Biology, České Budějovice, ČSSR.

Ecology

In the alluvial forest the abundance of *Eosentomon rusekianum* sp. n. reached 1300 Ind./m^2. The coenosis of Protura was completed by four other *Eosentomon*-species (with *Eosentomon stachi* RUSEK, 1966, as the dominating one), one *Proturentomon-*, one *Jonescuellum*- and one *Acerentulus*-species. The vertical distribution extended from litter-layer to a soil depth of 12 cm.

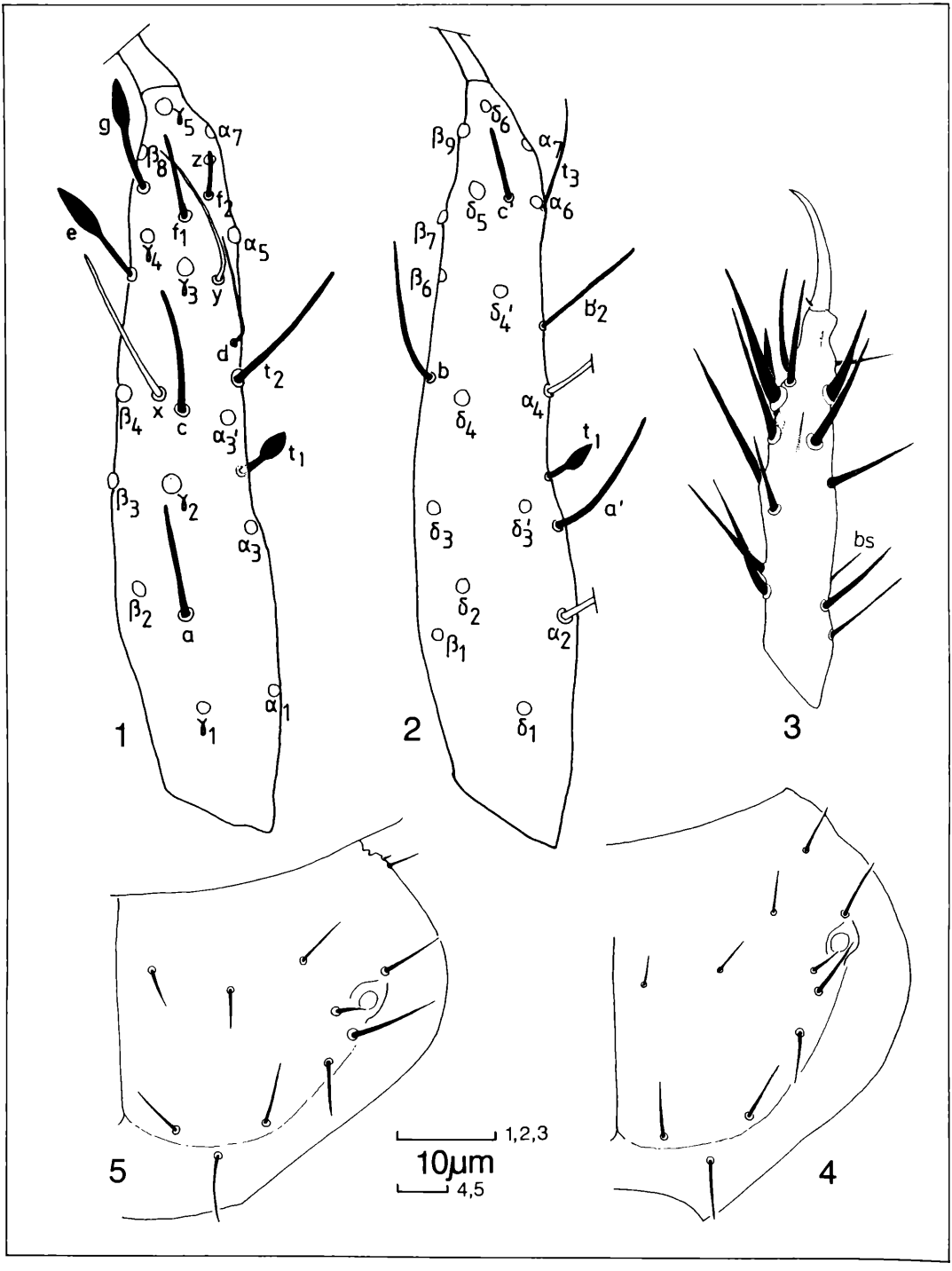

Fig. I: 1,2–holotype; 3–paratype 3; 4,5–paratype 1; 1–foretarsus, exterior view; 2–foretarsus, interior view; 3–tarsus of leg III with basal seta (bs); 4–mesonotum; 5–metanotum.

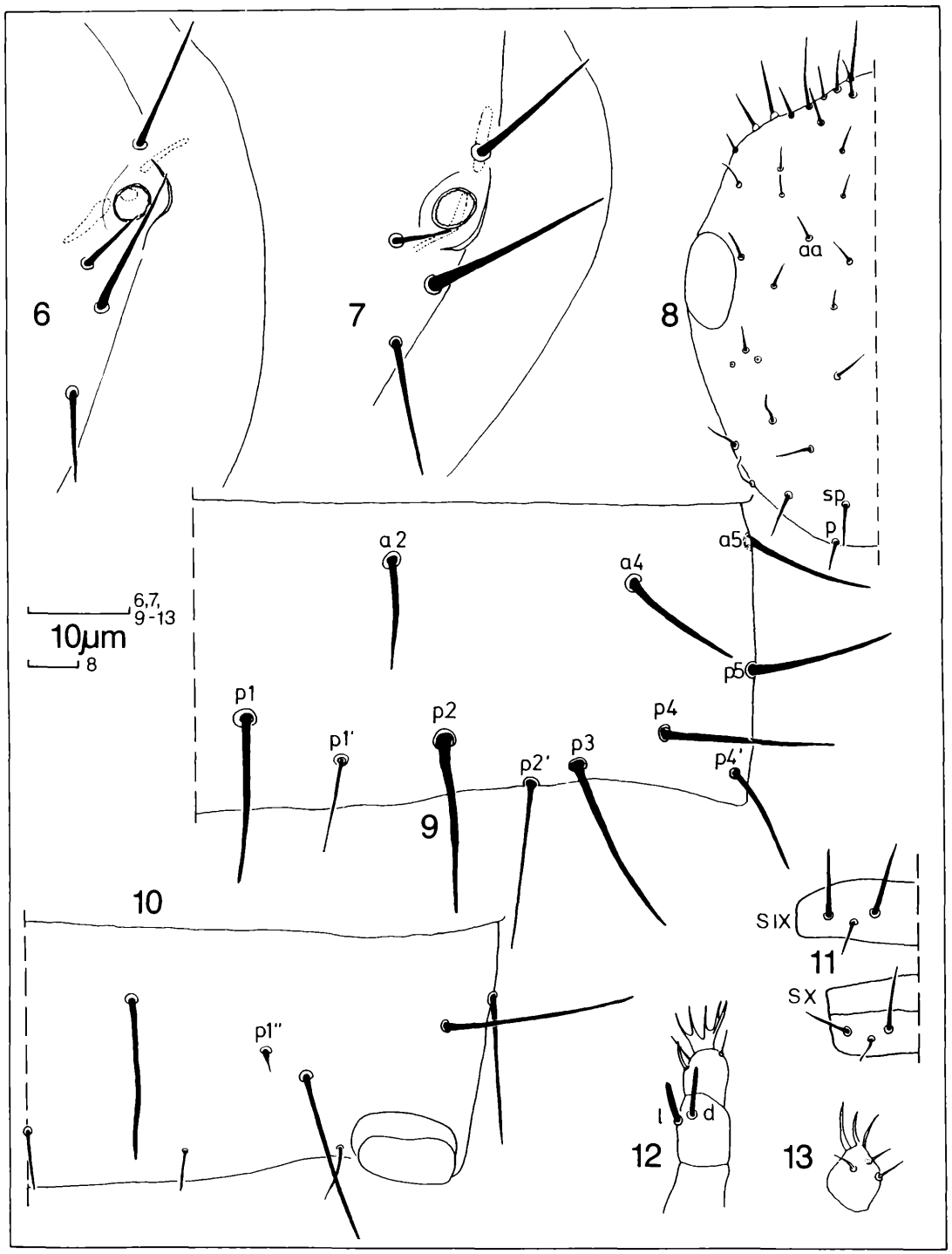

Fig. II: 6,7–paratype 1; 8,9,10,11–holotype; 12–paratype 3; 13–paratype 2; 6,7–tracheal camerae, stigma and surrounding setae on mesonotum (6) and metanotum (7); 8–head, dorsal view (p–posterior, sp–subposteroir, aa–anterior additional seta); 9–urotergite VII; 10–urotergite VIII; 11–urosternite IX and X; 12–maxillary palp with dorsal (d) and lateral (l) sensillae; 13– labial palp.

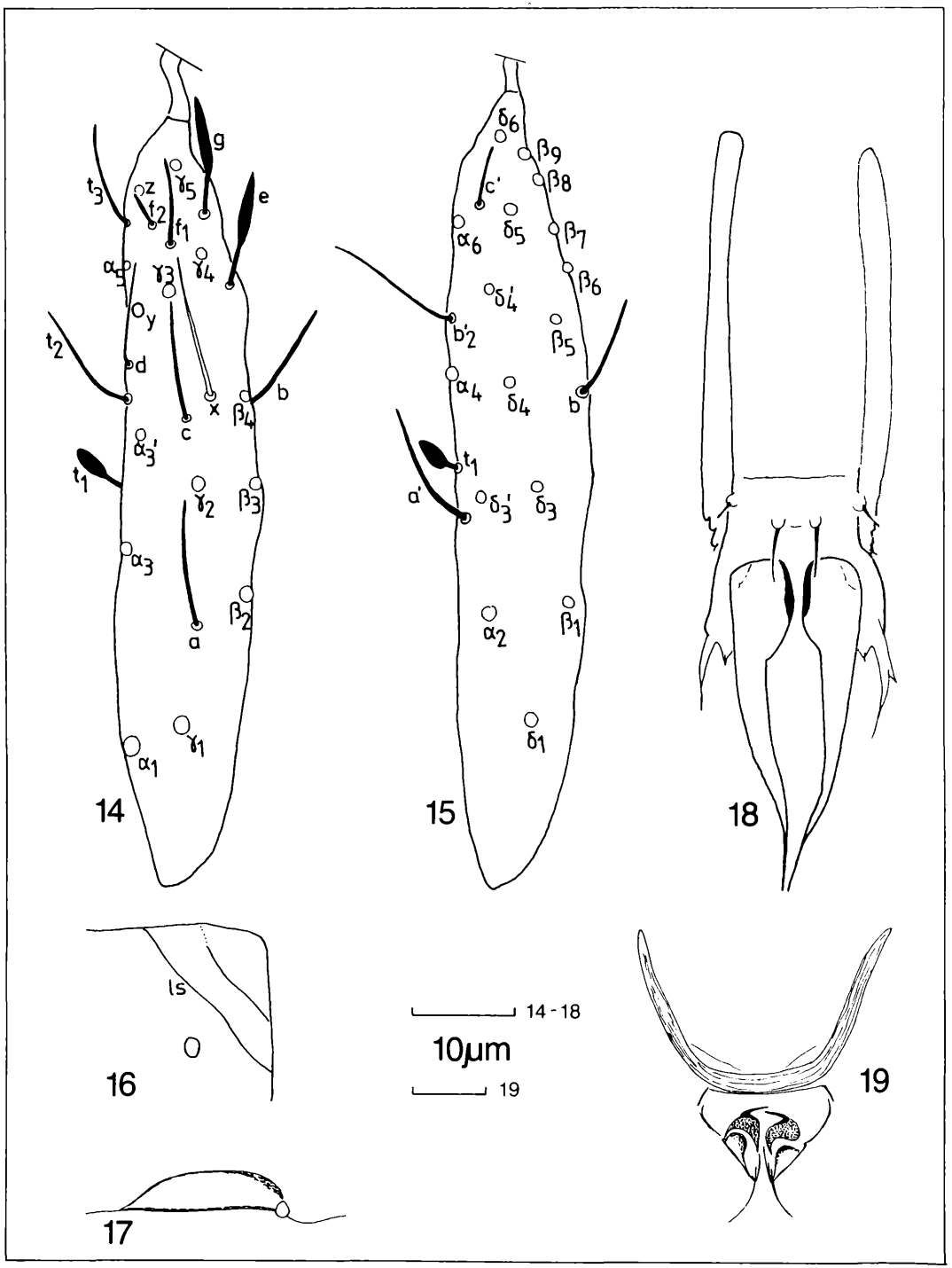

Fig. III: 14,15,19–paratype 3; 16,17–paratype 7; 18–holotype; 14–foretarsus, exterior view; 15–foretarsus, interior view; 16–urosternite VIII (ls–lateral sclerotization); 17–lateral part of antecosta III; 18–male squama genitalis; 19–female squama genitalis.

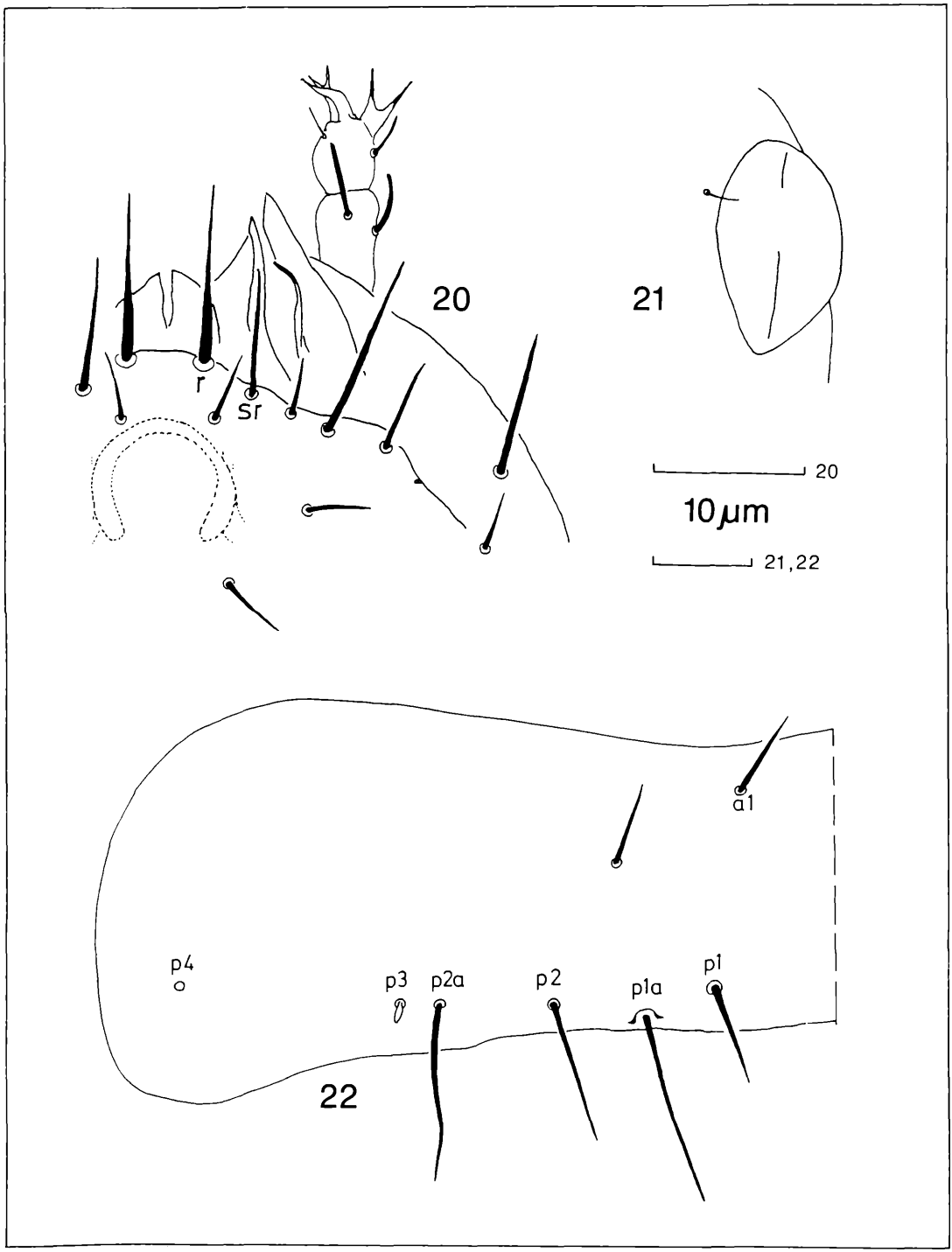

Fig IV: 20,21–paratype 5; 22–paratype 1; 20–anterior part of head with mouthparts, dorsal view (r–rostral, sr–subrostral seta); 21–pseudoculus with longitudinal line, 22–urotergite I.

Table 2. Biometrical characteristics of *Eosentomon rusekianum* sp. n.

				SD	n
head					
length	96.8 µm	(94–99)	±	1.48	9
breadth	81.3 µm	(80–89)	±	5.80	4
pseudoculus l	20.3 µm	(19–22)	±	1.00	9
b	14.0 µm	(14–14)	±	0.00	2
seta p	8.1 µm	(7– 9)	±	0.93	9
seta sp	8.2 µm	(7– 9)	±	0.67	9
mesonotum					
seta p1	10.3 µm	(10–11)	±	0.48	10
p1'	12.3 µm	(10–14)	±	1.64	10
p2	12.4 µm	(12–14)	±	0.84	10
p2'	8.4 µm	(7–10)	±	1.27	10
foretarsus					
length					
without claw	71.5 µm	(70–75)	±	1.72	10
claw	13.6 µm	(13–15)	±	0.70	10
empodium	11.0 µm	(10–11)	±	1.16	7
sensilla a	10.3 µm	(10–11)	±	0.50	4
b	12.6 µm	(11–14)	±	1.06	8
c	12.7 µm	(12–14)	±	0.82	6
d	12.5 µm	(11–13)	±	1.05	6
e	11.4 µm	(11–12)	±	0.53	9
f1	9.6 µm	(9–10)	±	0.79	7
f2	8.0 µm	(8– 8)	±	0.00	1
g	11.7 µm	(11–12)	±	0.50	9
a'	13.3 µm	(12–14)	±	0.95	10
b2'	13.0 µm	(12–14)	±	0.89	6
	6.5 µm	(6– 7)	±	0.58	4
ratio					
PR	4.77	(4.5–5.0)	±	0.19	9
TR	5.26	(5.0–5.6)	±	0.21	10
EU	0.82	(0.7–0.9)	±	0.01	7

$\bar{x}$ = mean; SD = standard deviation; n = sample size

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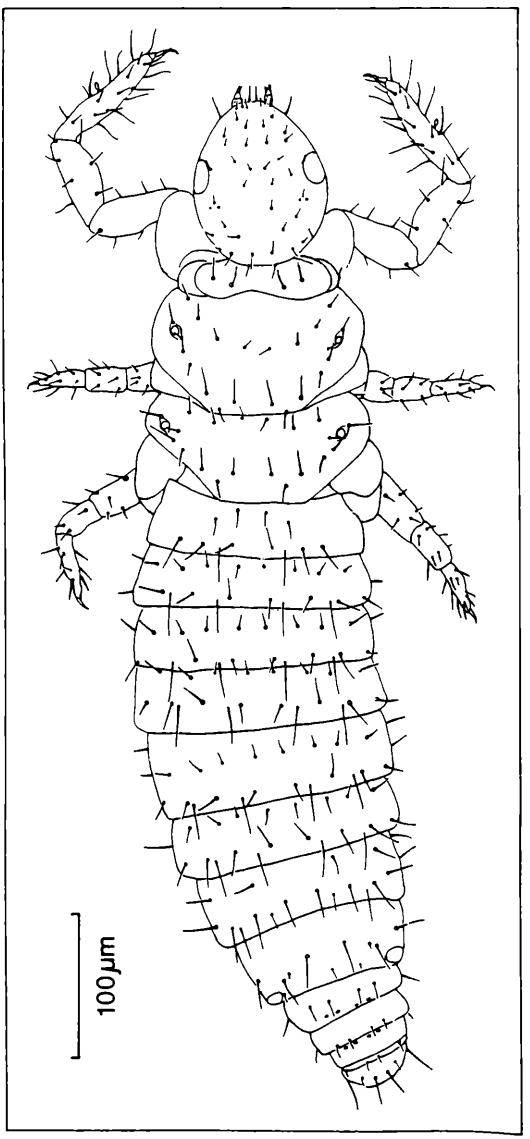

Fig. V: *Eosentomon rusekianum* sp. n., dorsal view (length 680 µm).