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Aculodes deschampsiae (Sukhareva, 1972) (Acari: Eriophyoidea) found on *Deschampsia caespitosa* (L.) P.B. in Poland: supplement for the description

ABSTRACT

Description of *Aculodes deschampsiae* (Sukhareva, 1972), new species from Poland, is supplemented. This species was found as vagrants on leaves of grass *Deschampsia caespitosa* (L.) P.B. The comparison of characters of populations from Poland and Russia is given.

Key words**:** Actinedida, phytophagous mite, tufted hairgrass, morphology.

INTRODUCTION

Over 3000 name species of eriophyoid mites are known in the world fauna including 120 species from grasses (Amrine et Stasny, 1994; Amrine, 1996). Up to the present 13 species of eriophyoid mites from plants belonging to the family Poaceae were collected in Poland. These belong to the genera *Abacarus, Aculodes, Aceria* (Boczek, 1964; Boczek *et al*.,1976; Jezewska et Wieczorek, 1998; Skoracka et Boczek, 2000).

The genus *Aculodes* Keifer, 1966 belongs to the family Eriophyidae Nalepa, 1898, subfamily Phyllocoptinae Nalepa, 1892, tribe Anthocoptini Amrine et Stasny, 1994 and included 10 described species in the year 1996 (Amrine, 1996).

Three species of genus *Aculodes* found on grasses in Poland have been known up to date: *A. agropyronis* (Keifer), *A. dubius* (Nalepa), *A. mckenziei* Keifer (Boczek *et al*., 1976; Skoracka, Boczek, 2000).

A new species for polish fauna *Aculodes deschampsiae* (Sukhareva, 1972) was found recently on tufted hairgrass (*Deschampsia caespitosa* (L.)P.B.). It was found on the same host plant in 1972 in Russia and described as *Phytocoptes deschampsiae*. Tufted hairgrass (Sukhareva, 1972) is the only host plant for this species; the relation to the host was defined as vagrant in grooves on upper leaf surface. Similar relationship and narrow specifity related to *A. deschampsiae* were also confirmed in Poland.

Because of the original description of *A. deschampsiae* (in particular that of male and nymph) is not complete, the present paper is intended to give the supplementary morphological description of this species. A comparison of characters of specimens of *A. deschampsiae* collected in Poland and Russia is supplied.

MATERIAL AND METHODS

Specimens of *A. deschampsiae* were collected from *D. caespitosa* originating from three different localities in Poland (Katowice, Bialowieza, Pieniny Mountains) by direct examination with a stereo-microscope. Mites were subsequently mounted on slides in the Heinze medium and studied with a phase-contrast microscope. The nomenclature of morphology follows that of Lindquist (1996). Lengths of legs are compared excluding coxae. All measurements are given in micrometers.

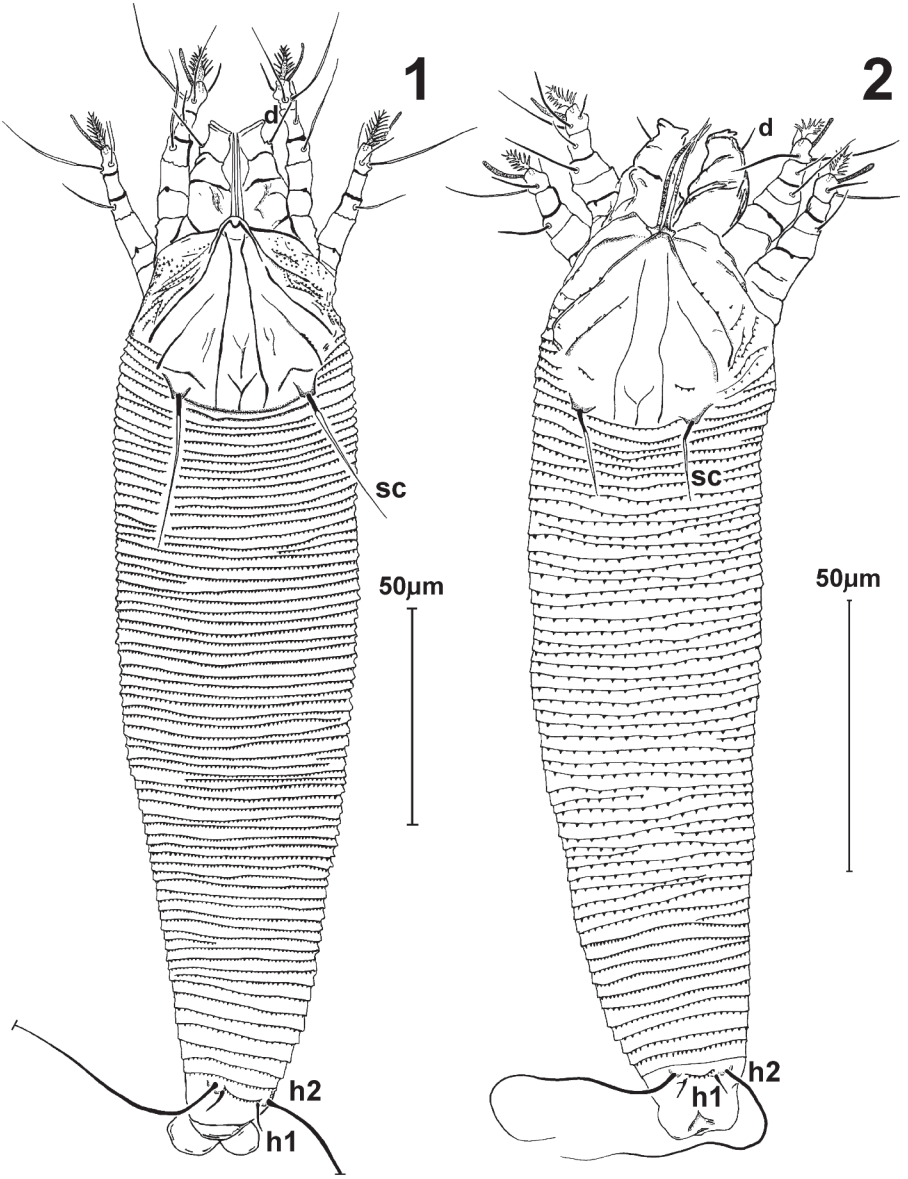
Measurements for the supplementary description were made using the sample collected 9.05.99, in Katowice. Additionally, measurements of specimens of the population from Pieniny and those from original description by Sukhareva are given in table 1. Specimens found in Bialowieza were not suitable for measuring.

All the examined material from Poland (63 females, 7 males, 4 nymphs) is kept in the collection of Department of Animal Taxonomy and Ecology, A. Mickiewicz University, Poznan, Poland.

SUPPLEMENTARY DESCRIPTION OF *A. DESCHAMPSIAE* (SUKHAREVA, 1972):

Female (figs 1, 3, 5-7): body length 255 (217-264); width 55 (52-58); body elongate, vermiform. Gnathosoma 29 (28-31) long; dorsal pedipalp genual setae *d* 10 (8-10) long; chelicerae 26 (25-30) long, almost straight. Prodorsal shield elongate-triangular, 48 (46-49) long; 46 (40-49) wide, with pronounced and elongate frontal lobe over the gnathosoma; median line present and divided into two lines, at least one of them splitting anteriorly, admedian lines entire, diverging from the base of anterior lobe to the rear margin of the shield, submedian lines shorter than admedian. Tubercles *sc* large, located on the rear margin, 29 (29-32) apart; setae *sc* 31 (29-34) long, projecting to the rear.

Leg I 32 (32-34) long; femur 9 (9-11) long, with seta *bv* 10 (8-11) long, below the middle of the femur; genu 5 (5-6) long, with seta *l''* 24 (22-26) long, in the transverse midline of the genu; tibia 7 (7-8) long, with seta *l'* 10 (10-11) long, in the midline of the tibia; tarsus 7 (7-8) long, with three setae,



Figs 1-2. *Aculodes deschampsiae: 1)* dorsal aspect of a female; 2) dorsal aspect of a nymph.

antaxial, fastigial tarsal seta *ft''* 27 (22-27); tarsal solenidion *ω* 10 (10-11) long; tarsal empodium simple, 8-rayed (7-8), symmetrical, 11 (10-11) long.

Leg II 32 (31-33) long; femur 10 (9-11) long, with seta *bv* 14 (11-14) long, located proximally of the midline of the femur; genu 5 (5-6) long, with seta *l''* 12 (11-13) long, in the transverse midline of the genu; tibia 6 (6-7) long; tarsus 8 (7-8) long, with three setae; antaxial fastigial tarsal seta *ft''* 26 (24-28) long; tarsal solenidion *ω* 10 (10-11) long; tarsal empodium 8-rayed (7-8), symmetrical, 11 long. Femoral setae located on ventral side of segment; genual, tibial and two tarsal (*ft'*, *ft"*) setae located on dorsal side of legs I and II.

Coxae with a pattern of short, slender lines, coxae I connecting medially; tubercles *1b* 11 (11-12) apart, setae *1b* 10 (8-10) long; tubercles *1a* 9 (8-10) apart, setae *1a* 24 (19-24) long; tubercles *2a* 25 (21-26) apart, setae *2a* 45 (42-46) long; distance between tubercles *1b* and *1a* 9 (8-10), distance between tubercles *1a* and *2a* 9 (8-9).

Opisthosoma with 62 (59-64) dorsal annuli, 70 (66-75) ventral annuli. Annuli with microtubercles triangular and pointed.

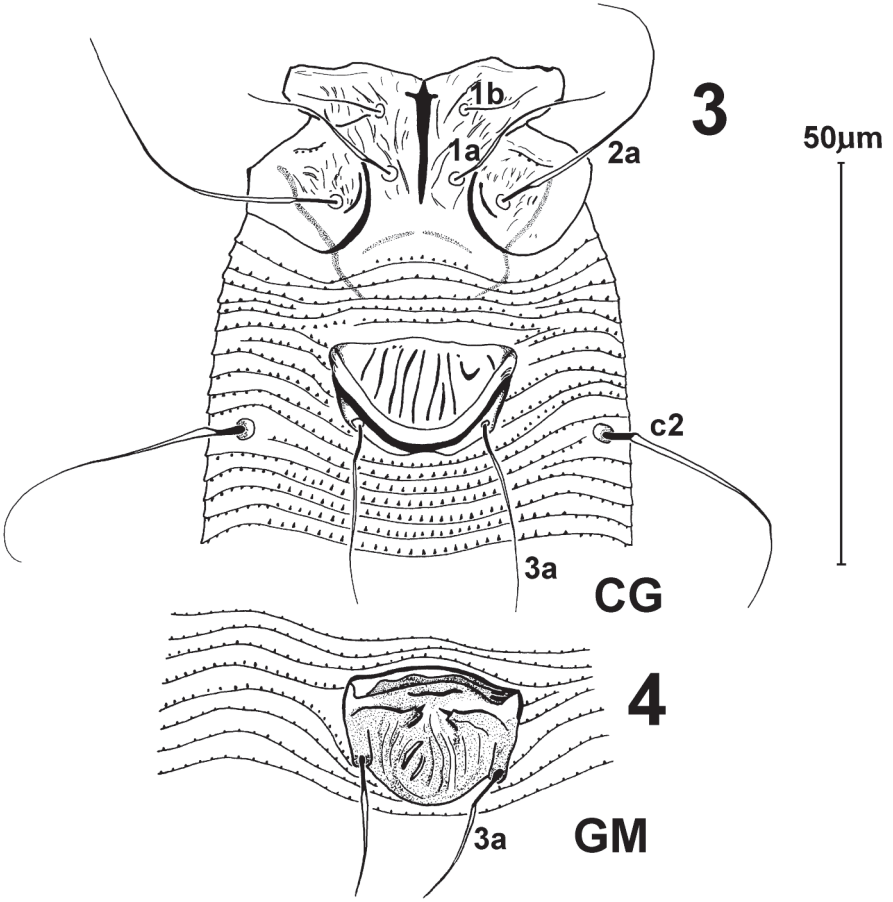
Setae *c2* 41 (35-43) long, located on 9th (8th-9th) ventral annulus from coxae II, tubercles *c2* 54 (46-55) apart; ventral setae *d* 36 (32-45) long, located on 22nd (20th-24th) ventral annulus, tubercles *d* 37 (30-37) apart; setae *e* 26 (18-29) long, located on 41st and 43rd ventral annulus (37-45), tubercles *e* 16 (15-18) apart; setae *f* 26 (20-27) long, located on 66th (62nd-71st) ventral annulus, 5th annulus from the rear, tubercles *f* 23 (20-23) apart.

Setae *h1* 4 (4-5) long, 8 (8-10) apart; setae *h2* 83 (76-83) long, 11 (11-14) apart; distance between *h1* and *h2* - 3.

Genital parts 15 (14-16) long, 24 (22-24) wide, situated about 6 ventral annuli behind the coxae II, genital coverflap with 11 (10-11) longitudinal striae, setae *3a* 24 (24-30) long, 18 (14-18) apart.

Male (Fig 4): body length 185 (185-277); body width 49 (49-51); elongate, vermiform. Gnathosoma 26 (26-27) long; dorsal pedipalp genual seta *d* 7 (7-8) long; chelicerae 20 (19-20) long. Prodorsal shield elongate-triangular, with pronounced and elongate frontal lobe over the gnathosoma, similar to that of a female, 42 (41-42) long, 41 (41-43) wide. Tubercles s*c* large, located on rear margin, 30 (30-31) apart; setae *sc* 27 (24-27) long.

Leg I 29 long; femur 9 long, with seta *bv* 8 long; genu 5 long, with seta *l''* 22 (21-22) long; tibia 7 long, with seta *l'* 10 long; tarsus 8 long; antaxial fastigial tarsal seta *ft''* 24 (19-24) long; tarsal solenidion *ω* 10 long; tarsal empodium 7-rayed, 11 long.



Figs 3-4. *Aculodes deschampsiae*: 3) coxogenital region (CG) of a female; 4) male, genital region (GM).

Leg II 30 (28-30) long; femur 10 long, with seta *bv* 13 (10-13) long; genu 5 long, with seta *l"* 11 (11-12) long; tibia 6 long; tarsus 8 (7-8) long; antaxial, fastigial tarsal seta *ft"* 25 (24-25) long; tarsal solenidion *ω* 11 (10-11) long; tarsal empodium 7-rayed, 10 long; setae of both legs located as in female.

Coxae covered with a pattern of short, slender lines; tubercles *1b* 11 apart, setae *1b* 8 long; tubercles *1a* 8 apart, setae *1a* 19 (14-19) long; tubercles *2a* 19 (19-22) apart, setae *2a* 29 (26-29) long; distance between tubercles *1b* and *1a* 8; distance between tubercles *1a* and *2a* 8.

Opisthosoma with 48 (48-49) dorsal and 59 (58-59) ventral annuli. Annuli completely microtuberculate; microtubercles pointed; last 4-6 ventral annuli with elongate microtubercles.

Setae *c2* 38 (37-38) long, located on 9th ventral annulus from coxae II, tubercles *c2* 45 apart; ventral setae *d* 29 (29-32) long, 30 apart, located on 17th ventral annulus; setae *e* 24 (24-30) long, 13 (13-14) apart, located on 33rd (32nd-33rd) ventral annulus; setae *f* 23 (23-25) long, 20 apart, on 55th (54th-55th) ventral annulus, on 5 annulus from the rear.

Setae *h1* 5 long, 8 apart; setae *h2* 86 (86-95) long, 12 apart; distance between *h1* and *h2* - 2.

Genital parts 14 long, 19 wide; setae *3a* 18 (18-22) long, tubercles *3a* 15 apart.

Nymph (Fig 2): body length 205 (186-205); body width 48 (48-50); elongate, vermiform. Gnathosoma 26 (26-27) long; dorsal pedipalp genual seta *d* 6 long; chelicerae 22 (18-22) long. Prodorsal shield triangular, with little lobe over the gnathosoma, 38 (38-39) long, 40 wide. Tubercles of setae *sc* large, located on rear margin, 26 (24-26) apart; setae *sc* 19 long.

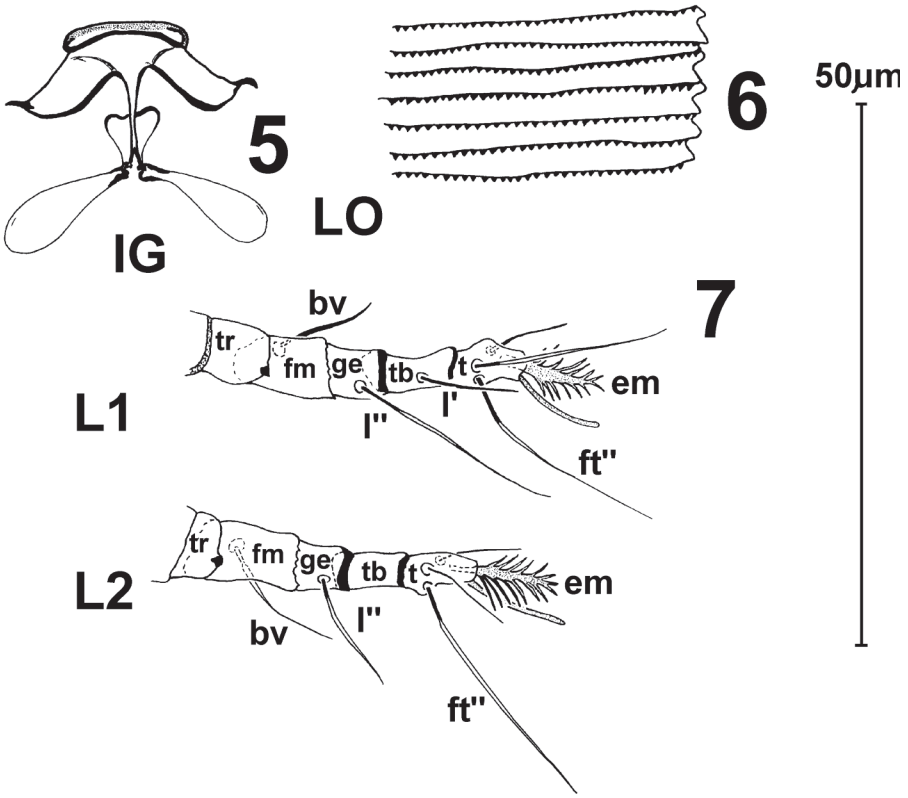
Leg I 22 (22-26) long; femur 8 long, with seta *bv* 7 long, in the transverse midline of ventral side of femur; genu 4 long, with seta *l''* 18 (18-20) long, in the transverse midline of latero-ventral side of genu; tibia 5 long, with seta *l'* 7 (6-7) long, in the transverse midline of dorsal side of tibia; tarsus 5 (5-7) long, with three setae; antaxial fastigial tarsal seta *ft''* 18 (18-20) long; tarsal solenidion *ω* 8 (8-9) long; tarsal empodium simple, 7-rayed, 9 long.

Leg II 24 (24-25) long; femur 6 long, with seta *bv* 8 long, in 1/3 from base of femur on ventral side; genu 3 long, with seta *l''* 8 (8-9) long, in the middle of latero-ventral side of genu; tibia 4 (4-5) long; tarsus 5 (5-6) long, with three setae; antaxial fastigial tarsal seta *ft''* 19 (19-20) long; tarsal solenidion *ω* 8 (8-9) long; tarsal empodium 7-rayed (6-7), 9 long.

Coxae covered with a pattern of short lines; tubercles *1b* 11 apart; tubercles *1a* 8 (8-9) apart; *2a* tubercles 20 (20-21) apart, setae *2a* 29 long; distance between tubercles *1b* and *1a* 8 (8-9); distance between tubercles *1a* and *2a* 7 (7-8).

Opisthosoma with 57 (57-58) dorsal and 58 (58-59) ventral annuli. Annuli completely microtuberculate, microtubercles pointed, last 3 ventral annuli with elongate microtubercles.

Setae *c2* 24 long, located on 10th (9th-10th) ventral annulus from coxae II, tubercles *c2* 40 (40-41) apart; setae *d* 19 (16-19) long, 28 (22-28) apart, located on 20th (20th-22nd) ventral annulus; setae *e* 11 long, 13 (11-13) apart,



Figs 5-7. *Aculodes deschampsiae*: 5) internal genitalia of a female (IG); 6) detail of some annuli of female (LO); 7) leg I (L1) and II (L2) of a female.

located on 33rd (33rd-34th) ventral annulus; setae *f* 17 long, 21 apart, located on 54th (54th-55th) ventral annulus, on 5th annulus from the rear.

Setae *h1* 3 long, 7 apart; setae *h2* 61 long, 11 apart; distance between *h1* and *h2* - 2.

Setae *3a* 8 (5-8) long, tubercles *3a* 10 apart.

REMARKS:

Four species of the genus *Aculodes* were found up to date in Poland on plants of family Poaceae: *A. agropyronis* (Keifer) on *Lolium perenne* L., *A. mckenziei* (Keifer) on *Agropyron repens* (L.)P.B., *A. dubius* (Nalepa) on *Festuca rubra* L., *Alopecurus aequalis* Sobol., *Bromus mollis* L., *Holcus lanatus* L., *L. perenne* L., *Phleum pratense* L., *Poa pratensis* L. (Boczek *et al*., 1976; Skoracka, Boczek 2000) and *A. deschampsiae* (Sukhareva) only on *Deschampsia caespitosa* (L.)P.B.

A. deschampsiae in Poland was found in three remote localities (Katowice, Pieniny and Bialowieza), all specimens of this species were found as vagrants in the grooves of upper surfaces of leaves. Number of specimens in sample collected in Katowice were 30-40 per leaf.

This species can be well characterized by the shape and very characteristic sculpture pattern on prodorsal shield, size of prodorsal shield, shape and appearance of microtubercles, lengths of setae *sc* and setae on the venter.

A. deschampsiae appears to be most similar to *A. agropyronis* (Keifer) by pointed microtubercles, triangular prodorsal shield, presence of median and position of admedian lines, dimensions of prodorsal shield and female coverflap, and lengths of *c2*, *e*, *f*, *h1* and *3a* setae. In females of *A. deschampsiae* those measurements are: prodorsal shield – 48 long, genital parts 15 long, 24 wide, lengths of setae: *c2* – 41, *e* – 26, *f* – 26, *h1* – 4, *3a* – 24. In females of *A. agropyronis* those: prodorsal shield – 46 long, genital parts 12 long, 22 wide, lengths of setae: *c2* – 36, *e* – 24, *f* – 26, *h1* – 6, *3a* – 27.

Those two species differ in length of *sc*, ventral *d* and palpal *d* setae; there are also some differences in pattern on prodorsal shield (Keifer, 1960). In *A. deschampsiae* lengths of those setae are: *sc* – 31, ventral *d* – 36, palpal *d* – 10; while in *A. agropyronis*: *sc* – 46, ventral *d* – 70, palpal *d* – 4.

Sukhareva (1972) regards *A. dubius* as the most similar species to *A. deschampsiae*. They have similar shape of prodorsal shield, but in *A. dubius* prodorsal shield is larger and there is no median line, they also differ by form of microtubercles and lengths of setae.

Females of *A. deschampsiae* from Poland and from Russia are similar in morphology, however in the original description only a few measurements are given for male and nymph. Therefore, it is difficult to make the comparison between russian and polish populations of the species. There are no considerable differences between the two populations collected in Poland; some of them may result from intraspecific variability (tab. 1).

Tab. 1 - Comparison of measurements of *Aculodes deschampsiae* (Sukhareva, 1972) collected in Poland and Russia.

stage	Females			Males			Nymphs	
Date and locality of collecting samples	5.09.68; Petersburg, Russia	24.08.99; Pieniny, Poland range of 9 specimens	09.05.99; Katowice, Poland range of 7 specimens	5.09.68; Petersburg, Russia	24.08.99; Pieniny, Poland range of 4 specimens	09.05.99; Katowice' Poland range of 2 specimens	5.09.68; Petersburg, Russia	24.08.99; Pieniny, Poland range of 2 specimens
length of body	188 (176-250,6)	206-287	217-264	160-170	198-228	185-277	170 (140-200)	186-205
width of body	50 (42-52)	54-67	52-58	50	47-51	49-51	50 (45-57)	48-50
length of gnatosoma	24,7 (24,3-25,9)	29-32	28-31	24.7	25-29	26-27	20 (19,5-21,2)	26-27
length of pedipalp seta *d*	-	8-10	8-10	-	7-8	7-8	-	6
length of chelicerae	-	22-31	25-30	-	21-24	19-20	-	18-22
length of prodorsal shield	42,5 (41,3-46)	46-51	46-49	37,7 (35,6-38)	43	41-42	31,8 (28,3-34,2)	38-39
width of prodorsal shield	35,4	43-48	40-49	32 (31-32,8)	40	41-43	-	40
length of setae *sc*	29,5 (24-33)	26-36	29-34	23,6 (22,4-25)	23-24	24-27	21,2 (17,7-23,6)	19
tubercles of *sc* apart	23,2 (23-23,6)	28-30	29-32	24,7 (23,6-24,8)	26-28	30-31	-	24-26
No. of dorsal annuli	60-68	60-68	59-64	-	52-53	48-49	52-60	57-58
No. of ventral annuli	57-66	68-77	66-75	-	54-63	58-59	-	58-59
length of setae *c2*	32 (30-35)	29-38	35-43	-	26-35	37-38	-	24
location *c2* on ventral annulus	7-8	7-10	8-9	-	7-8	9	-	9-10
tubercles of *c2* apart	-	46-52	46-55	-	37-46	45	-	40-41
length of setae *d*	30 (27-32)	30-39	32-45	-	33-38	29-32	-	16-19
location *d* on ventral annulus	18-22	20-23	20-24	-	18-19	17	-	20-22
tubercles of *d* apart	-	26-36	30-37	-	27-30	30	-	22-28
length of setae *e*	19 (18-20)	18-31	18-29	-	14-19	24-30	-	11
location *e* on ventral annulus	35-38	37-46	37-45	-	35-36	32-33	-	33-34
tubercles of *e* apart	-	13-16	15-18	-	12-14	13-14	-	11-13
length of setae *f*	18 (17-20)	24-27	20-27	-	19-24	23-25	-	17
location *f* on ventral annulus	4 from rear	63-73	62-71	-	59	54-55	-	54-55
tubercles of *f* apart	-	18-24	20-23	-	16-21	20	-	21
length of setae *b1*	3.5	4-5	4-5	-	3-5	5	-	3
length of setae *b2*	90	74-86	76-83	-	67-76	86-95	-	61
tubercles of *b1* apart	-	8-9	8-10	-	7-8	8	-	7
tubercles of *b2* apart	-	11-14	11-14	-	9-11	12	-	11
distance between *b1* and *b2*	-	3-4	3	-	2-3	2	-	2
length of genital parts	10,6 (10,4-11,8)	12-16	14-16	10,6 (10,2-11,2)	14	14	-	-
width of genital parts	20 (18,6-22,4)	21-25	22-24	18 (17,7-18,2)	19-21	19	-	-
length of setae *3a*	18 (17,6-20)	18-25	24-30	-	15-19	18-22	-	6-8
tubercles of *3a* apart	-	15-17	14-18	-	14-18	15	-	10
No. striae on female coverflap	10-11	8-11	10-11	-	-	-	-	-
tubercles of *1b* apart	9,4 (8,6-9)	10-11	11-12	-	10-11	11	-	11
length of setae *1b*	-	7-8	8-10	-	8	8	-	-
tubercles of *1a* apart	7 (6,7-7,2)	9-11	8-10	-	6-9	8	-	8-9
length of setae *1a*	-	19-28	19-24	-	16-27	14-19	-	-
tubercles of *2a* apart	17 (17-18)	21-26	21-26	-	19-23	19-22	-	20-21
length of setae *2a*	-	36-47	42-46	-	34-40	26-29	-	29
tubercles of *1b* and *1a* apart	9,4 (8,6-9,4)	8-10	8-10	-	8-10	8	-	8-9
tubercles of *1a* and *2a* apart	12,5 (11,8-13)	8-9	8-9	-	8-9	8	-	7-8
length of leg I	33 (31-34)	30-39	32-34	30 (29-32,3)	30-33	29	21 (18,8-23,6)	22-26
length of femur I	-	10-11	9-11	-	9-10	9	-	8
length of setae *bv*	-	8-10	8-11	-	7-8	8	-	7
length of genu I	-	5-7	5-6	-	6	5	-	4
length of setae *l″*	-	20-24	22-26	-	19-20	21-22	-	18-20
length of tibia I	5,7 (5,3-7)	6-8	7-8	6	6-7	7	-	5
length of setae *l′*	-	8-11	10-11	-	9-11	10	-	6-7
length of tarsus I	7	7-9	7-8	7	6-8	8	-	5-7
length of setae *ft″*	-	20-27	22-27	-	21-24	19-24	-	18-20
length of tarsal I solenidion	8,2 (8-9)	10-11	10-11	8.2	10-11	10	-	8-9
length of tarsal I empodium	7	8-11	10-11	7	10-11	11	-	9
No. of rays of tarsal I empodium	7-8	8	7-8	7	7	7	-	7
length of leg II	28 (27-29)	31-35	31-33	-	29-30	28-30	17,7 (17-18,8)	24-25
length of femur II	-	11	9-11	-	9-10	10	-	6
length of setae *bv*	-	11-13	11-14	-	10-11	10-13	-	8
length of genu II	-	5-8	5-6	-	5-7	5	-	3
length of setae *l″*	-	11-13	11-13	-	11	11-12	-	8-9
length of tibia II	5,3 (5,6-5,9)	6-7	6-7	-	5-6	6	-	4-5
length of tarsus II	7	7-9	7-8	-	6-7	7-8	-	4-6
length of setae *ft″*	-	23-27	24-28	-	24-25	24-25	-	19-20
length of tarsal II solenidion	8,2 (8-9)	10-12	10-11	-	11	10-11	-	8-9
length of tarsal II empodium	7	10-11	11	-	9-10	10	-	9
No. of rays of tarsal II empodium	7-8	8	7-8	-	7	7	-	6-7

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RIASSUNTO

Aculodes deschampsiae (Sukhareva, 1972) (Acari: Eriophyoidea) associato a *Deschampsia caespitosa* (L.) P.B. in Polonia: supplemento di descrizione

La descrizione di *Aculodes deschampsiae* (Sukhareva, 1972), nuova segnalazione per la Polonia, viene ampliata. Questa specie fu rinvenuta come vagante su foglie di *Deschampsia caespitosa* (L.) P.B. Nel presente contributo è eseguita la comparazione dei caratteri delle popolazioni raccolte in Polonia e Russia.

Parole chiave: Actinedida, acari fitofagi, morfologia.

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