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A new species of eriophyoid mite from *Festuca altissima* ALL. (*Poaceae*) in Poland (*Acari*: *Eriophyoidea*)

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ABSTRACT. *Abacarus tucholensis,* new mite species is described from Poland (Bory Tucholskie Forest). This species was found as vagrant on leaves of grass *Festuca altissima* ALL.

Key words**:** acarology, *Prostigmata*, *Eriophyoidea*, *Abacarus*, new species, morphology, *Poaceae, Festuca altissima.*

INTRODUCTION

Over 3000 specific names of eriophyoid mites are known in the world fauna, including 122 reported from grasses (AMRINE 1996; AMRINE & STASNY 1994; AMRINE & DE LILLO - in prep.). Fourteen species of eriophyoid mites of the genera *Abacarus* KEIFER, 1944, *Aculodes* KEIFER, 1966, *Aceria* KEIFER, 1944, *Novophytoptus* ROIVAINEN, 1947, were collected from grasses in Poland up to the present (BOCZEK 1964; BOCZEK et al.1976; JEŻEWSKA & WIECZOREK 1998; SKORACKA & BOCZEK 2000a; SKORACKA & BOCZEK 2000b).

The genus *Abacarus* belongs to the family *Eriophyidae* NALEPA, 1898, subfamily *Phyllocoptinae* NALEPA, 1892, tribe *Anthocoptini* AMRINE et STASNY, 1994, and includes 40 described species, of these 20 species are associated with *Poaceae* (AMRINE 1996; AMRINE & DE LILLO - in prep.; SHI & BOCZEK 2000). Only two grass-associated species of the genus *Abacarus* have been known from Poland to date: *A. hystrix* (NALEPA, 1896) and *A. acutatus* (SUKHAREVA, 1985) (BOCZEK et al. 1976; SKORACKA & BOCZEK 2000a).

MATERIAL AND METHODS

Specimens of the new species were collected from specimens of *F. altissima,* by direct examination with a stereo-microscope. Mites were subsequently mounted on slides in the Heinze medium and examined in a phase-contrast microscope. The nomenclature of morphology follows that of LINDQUIST (1996). The measurements of mites were taken according to AMRINE & MANSON (1996). The systematic placement follows that of AMRINE (1996). All measurements are given in micrometers.

Abacarus tucholensis sp. n.

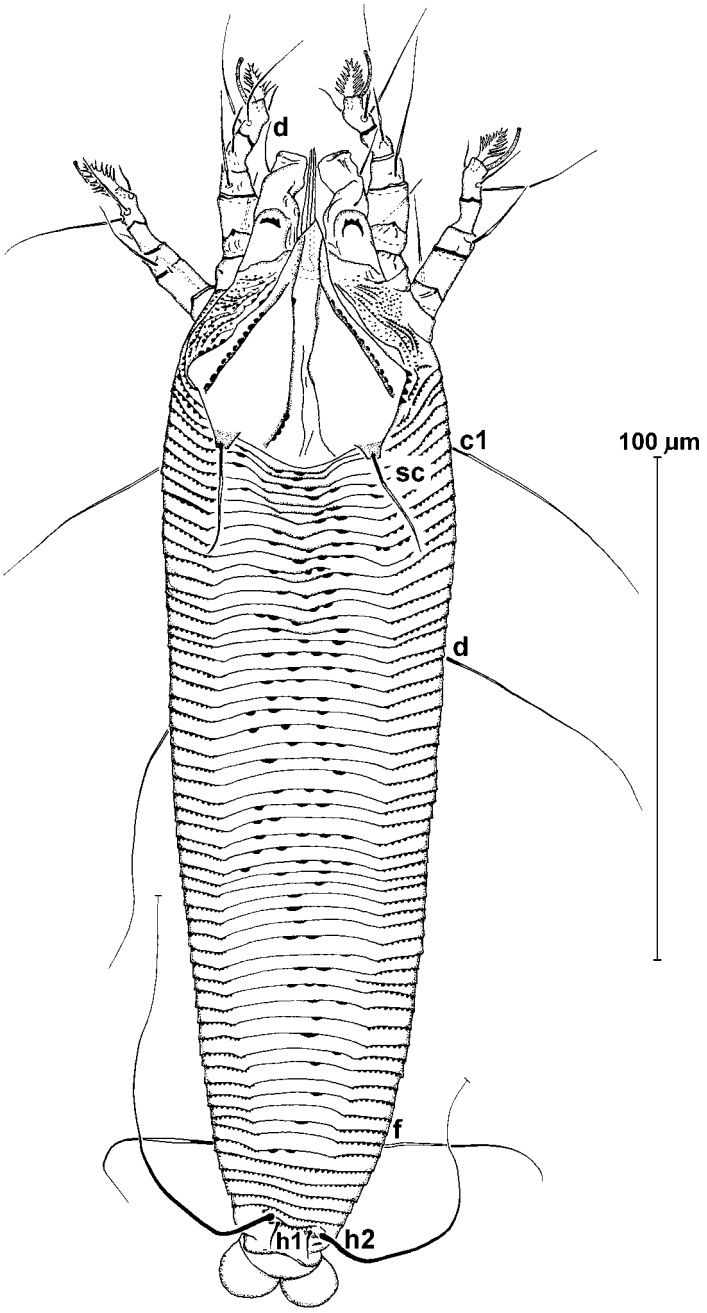
DESCRIPTION

Female (Figs 1-8): body length of holotype 206 (190-277 of paratypes, range of 11 specimens); width 59 (54-59); body spindle-shaped. Dorsomedian ridge short, ending near 14-15 dorsal annulus, dorsal furrow ending near 6-7 annulus from the end. Gnathosoma 23 (23-28) long; dorsal pedipalpal genual setae *d* 10 long; *v* setae 2 (2-3) long; *ep* seta (4-4,5) long, chelicerae 24 (22-28) long, almost straight. Prodorsal shield elongate-triangular, 50 (49-52) long; 44 (42-47) wide, with pronounced, elongated and pointed frontal lobe over the gnathosoma; median line present in posterior half of the shield, not reaching to rear margin of the shield, sometimes divided into two lines; admedian lines entire, parallel to each other and diverging near the rear margin of the shield; submedian lines begining near the base of lobe over gnathosoma or sometimes connecting with admedian lines, parallel to lateral margin of the shield. Tubercles *sc* large, located on the rear margin of shield, 4 (4-5) long, 30 (27-31) apart; setae *sc* 21 (20-29) long, projecting to the rear.

Leg I 33 (32-38) long; femur 10 (10-11) long, with seta *bv* 14 (12-16) long; position of the seta *bv* 3,5 (3-4) from the ventral, proximal margin of femur; genu 5 (5-6) long, with seta *l''* 25 (24-29) long, position of the seta *l''* 3 (2,5-3) from the dorsal, proximal margin of genu; tibia 8,5 (8-9) long, with seta *l'* 10 (9-12) long; position of the seta *l'* 4 (4-4,5) from the ventral, proximal margin of tibia. Tarsus 7 (7-8) long, with three setae: *ft''* 25 (23-28); *ft'* 19 (16-22) long, *u'* 7 (7-8) long; tarsal solenidion ω 10 long, with a little knob at the end; tarsal empodium simple, 7-rayed, symmetrical, 11 (10-11) long.

Leg II 32 (31-35) long; femur 10 (10-11) long, with seta *bv* 19 (19-27) long; position of the seta *bv* 4 (3,5-4) from the ventral, proximal margin of femur; genu 5 long, with seta *l''* 14 (14-17) long; position of the seta *l''* 3 (2,5-3) from the dorsal, proximal margin of genu; tibia 7 long. Tarsus 7 (7-8) long, with three setae: *ft''* 26 (23-27) long, *ft'* 10 (10-16), *u'* 8 (7-8) long; tarsal solenidion ω 10 long, with a small knob at the end; tarsal empodium 7-rayed , symmetrical, 11 (10-11) long.

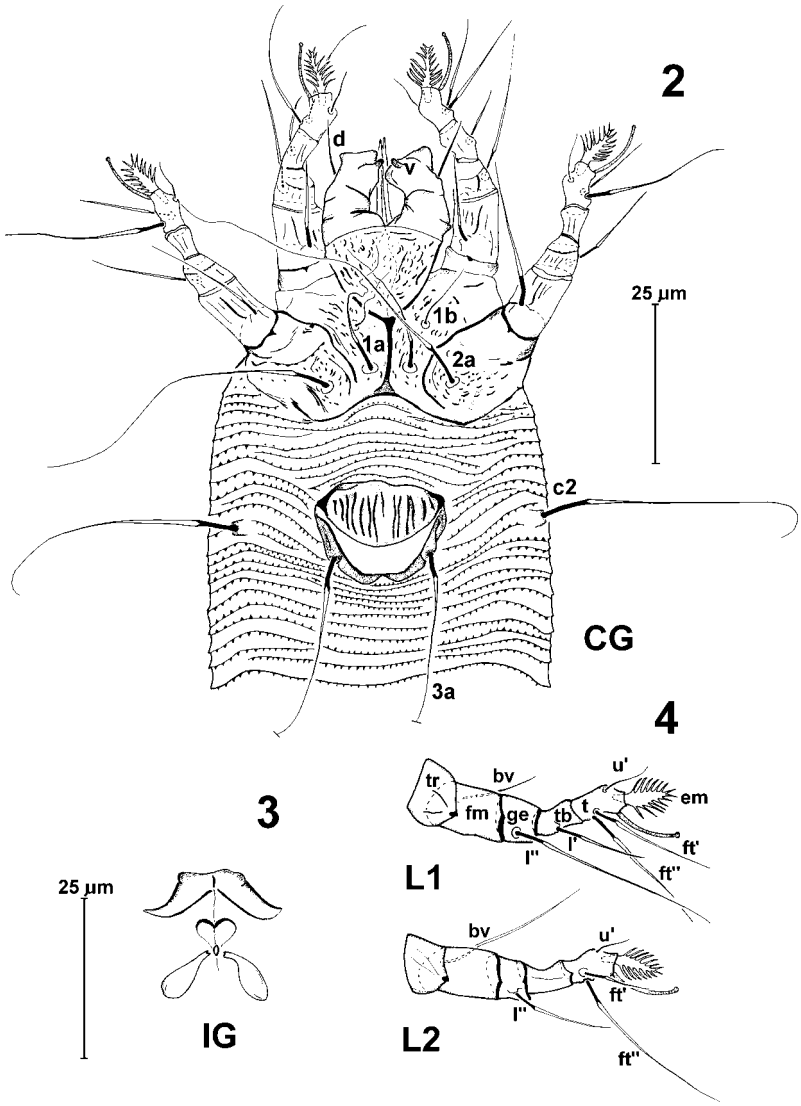
Coxae with a pattern of numerous, short, slender lines; coxae I connected medially; tubercles *1b* 10 (9-11) apart, setae *1b* 11 (8-14) long; tubercles *1a* 8 (7-8) apart, setae *1a* 29 (21-30) long; tubercles *2a* 22 (19-22) apart, setae *2a* 52 (42-



1. *Abacarus tucholensis* sp.n. – dorsal aspect of a female

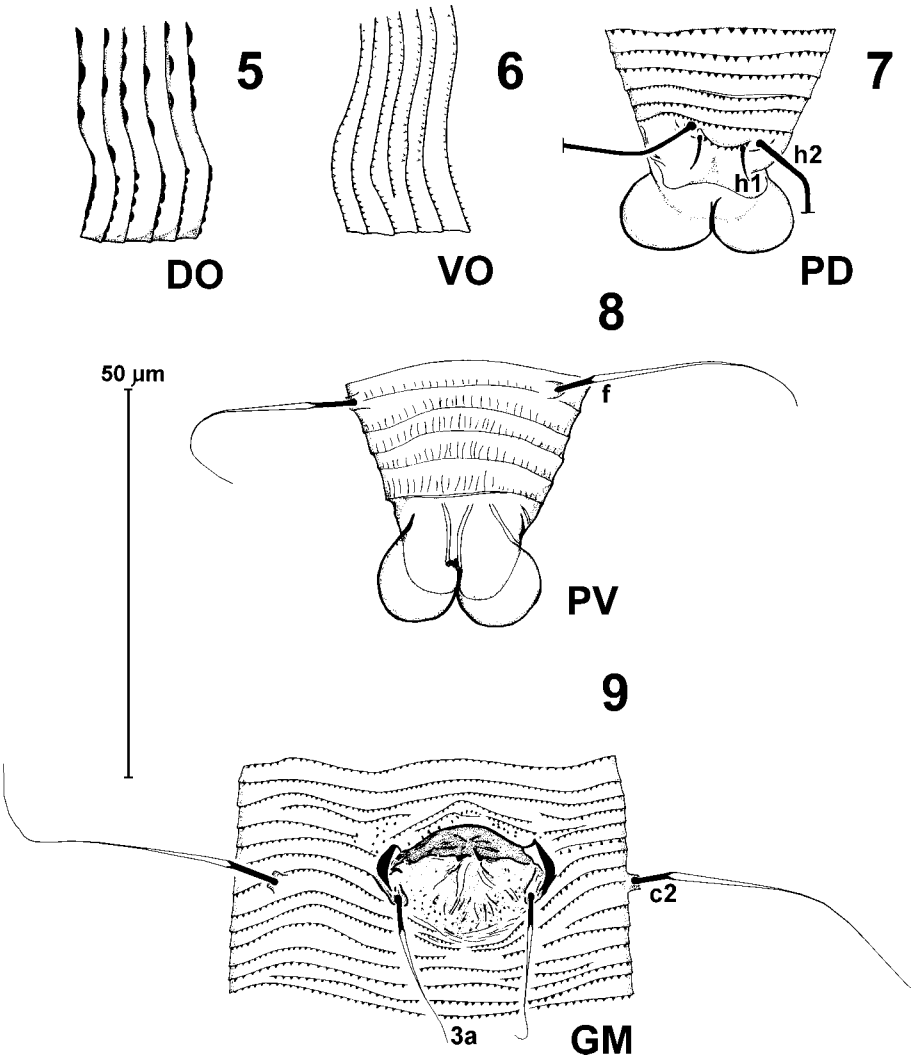
52) long; distance between tubercles *1b* and *1a* 8 (7-9), distance between tubercles *1a* and *2a* 8 (7-9).

Opisthosoma with 56 (54-58) dorsal annuli, 74 (69-75) ventral annuli, 7 coxogenital annuli. Annuli with microtubercles; ventral microtubercles minute and pointed, from the level of setae *f* elongated; microtuberles on the dorsal annuli relatively large, irregular, sparse and subrounded on the ridge and furrow, smaller and more numerous on lateral side of body, near the end of furrow are pointed.



2-4. *Abacarus tucholensis* sp.n. – 2: coxogenital region (CG) of a female, 3: internal genitalia of a female (IG); 4: legI (L1) and leg II (L2) of a female

Setae *c2* 39 (38-46) long, located on 9th (8th-10th) ventral annulus from coxae II; tubercles *c2* 53 (48-53) apart; ventral setae *d* 71 (52-76) long, located on 22nd (21th-24th) ventral annulus; tubercles *d* 37 (32-37) apart, 39 (28-45) microtubercles present between tubercles *d*; setae *e* 38 (27-38) long, located on 42nd ventral annulus (40-45); tubercles *e* 17 (15-20) apart, 11 (11-16) microtubercles present between tubercles *e*; setae *f* 34 (29-38) long, located on 69th (63rd –72nd) ventral



5-9. *Abacarus tucholensis* sp. n.– 5: detail of dorsal annuli of a female (LO); 6- detail of ventral annuli of a female (VO); 7: postero-dorsal aspect of a female (telosoma) (PD); 8: postero-ventral aspect of a female (telosoma) (PV); 9: male, genital region (GM)

annulus, 5th annulus from the rear; tubercles *f* 28 (24-28) apart, 21 (21-29) microtubercles present between tubercles *f*. All tubercles of ventral setae are relatively large and distinct.

Setae *h1* 4 (4-5) long, 6 (6-8) apart; setae *h2* 100 (84-105) long, 10 (10-11) apart; distance between *h1* and *h2* – 2,5 (2-3).

Genital parts 15 (15-18) long, 21 (21-24) wide, genital coverflap with 14 (12-14) longitudinal striae; setae *3a* 31 (29-48) long, 16 (15-17) apart.

Male (Fig 9): body length (224-240, range of 6 specimens); body width (50-53), spindle-shaped; short dorsal ridge present. Gnathosoma (24-27) long; dorsal pedipalpal genual seta *d* (9-10) long; ; *v* setae 2 long; chelicerae (21-24) long, almost straight. Prodorsal shield elongate-triangular, (45-48) long; (40-43) wide, with pronounced, elongate and pointed frontal lobe over the gnathosoma; pattern of the shield similar to that of female. Tubercles *sc* large, located on the rear margin of the shield, 4 long, (25-28) apart; setae *sc* (21-22) long, projecting posterad.

Leg I (29-33) long; femur (9-10) long, with seta *bv* (11-14) long; position of the seta *bv* 4 from the ventral, proximal margin of femur; genu 5 long, with seta *l''* (22-24) long; position of the seta *l''* 3 from the dorsal, proximal margin of genu; tibia (7-8) long, with seta *l'* (9-10) long; position of the seta *l'* 4 from the ventral, proximal margin of tibia. Tarsus (7-8) long, with three setae: *ft''* (21-24); *ft'* (16-18) long, *u'* (7-8) long; tarsal solenidion *ω* (9-10) long, with a little knob at the end; tarsal empodium simple, 7-rayed , symmetrical, (9-10) long.

Leg II (29-32) long; femur 10 long, with seta *bv* (17-21) long; position of the seta *bv* 4 from the ventral proximal margin of femur; genu 5 long, with seta *l''* (12-17) long; position of the seta *l''* 3 from the dorsal, proximal margin of genu; tibia (6-7) long. Tarsus 7 long, with three setae: *ft''* (22-25) long, *ft'* (9-11), *u'* (7-8) long; tarsal solenidion *ω* 10 long, with a small knob at the end; tarsal empodium 6-7-rayed, symmetrical, 10 long.

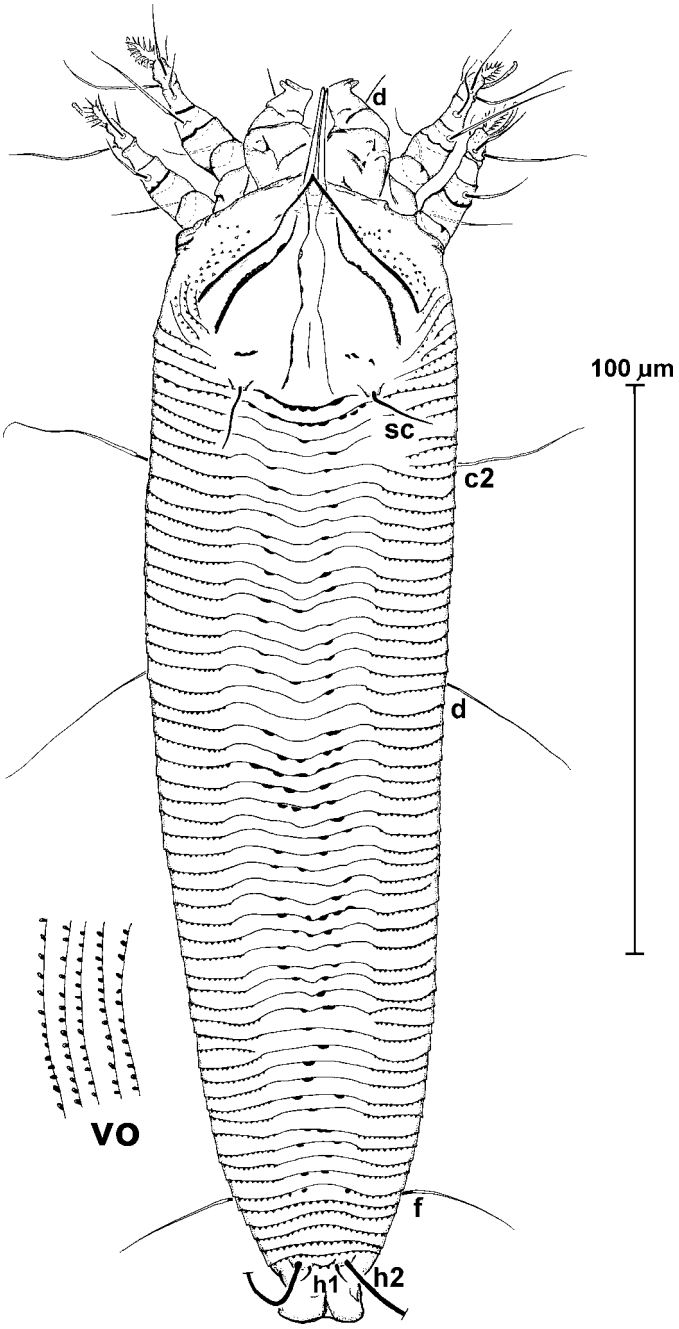
Coxae with a pattern of short, slender lines; coxae I connecting medially; tubercles *1b* (10-11) apart, setae *1b* (10-11) long; tubercles *1a* (7-8) apart, setae *1a* (24-30) long; tubercles *2a* (21-22) apart, setae *2a* (43-52) long; distance between tubercles *1b* and *1a* (7-8), distance between tubercles *1a* and *2a* (7-8).

Opisthosoma with (49-53) dorsal annuli, (63-67) ventral annuli, 7 coxogenital annuli. Annuli with microtubercles, their size and shape similar to that of female.

Setae *c2* (37-43) long, located on (9th-10th) ventral annulus from coxae II; tubercles *c2* (48-50) apart; ventral setae *d* (67-81) long, located on (20th-22nd) ventral annulus; tubercles *d* (31-33) apart, 38 microtubercles present between tubercles *d*; setae *e* (27-38) long, located on (37th-39th) ventral annulus; tubercles *e* (16-17) apart, (12-14) microtubercles present between tubercles *e*; setae *f* (24-35) long, located on (59th-64th) ventral annulus, 5th annulus from the rear; tubercles *f* (20-28) apart, (25-26) microtubercles present between tubercles *f*.

Setae *h1* (4-5) long, (6-8) apart; setae *h2* 63 long, (9-10) apart; distance between *h1* and *h2* – 2.

Genital parts (15-17) long, (21-23) wide; setae *3a* (24-38) long, (17-19) apart.



10. *Abacarus tucholensis* sp. n. - dorsal aspect of a nymph

Nymph (Fig 10): body length 211 (one specimen measured); body width 54; spindle-shaped. Short dorsal ridge present. Gnathosoma 23 long; dorsal pedipalpal genual seta *d* 7 long; *v* setae 2,5 long; chelicerae 25 long. Prodorsal shield 38 long, 38 wide, triangular, with a small pointed lobe over the gnathosoma; median line only in the lower part of shield, not reaching to its rear margin; admedian lines undulated, diverging from each other near the rear margin of the shield; submedian lines begining near the base of lobe and diverging to lateral margin of the shield. Tubercles of setae *sc* 2 long, located on rear margin of the shield, 24 apart; setae *sc* 12 long.

Leg I 30 long; femur 8 long, with seta *bv* 9 long; position of the seta *bv* 3 from the ventral, proximal margin of femur; genu 4 long, with seta *l''* 22 long; position of the seta *l''* 2 from the dorsal, proximal margin of genu; tibia 5 long, with seta *l'* 8 long; position of the seta *l'* 3 from the ventral, proximal margin of tibia. Tarsus 6 long, with three setae: *ft''* 17; *ft'* 13 long, *u'* 5 long; tarsal solenidion *ω* 7 long, with a little knob at the end; tarsal empodium simple, 6-rayed , symmetrical, 8 long.

Leg II 27 long; femur 7 long, with seta *bv* 13 long; position of the seta *bv* 3 from the ventral, proximal margin of femur; genu 4 long, with seta *l''* 12 long; position of the seta *l''* 2 from the dorsal, proximal margin of genu; tibia 5 long. Tarsus 5 long, with three setae: *ft''* 17 long, *ft'* 6, *u'* 5 long; tarsal solenidion *ω* 7 long, with a little knob at the end; tarsal empodium 6-rayed, symmetrical, 8 long.

Coxae with a pattern of short, slender lines and spots; coxae I connecting medially; tubercles *1b* 11 apart; tubercles *1a* 10 apart, setae *1a* 13 long; tubercles *2a* 17 apart; distance between tubercles *1b* and *1a* 9, distance between tubercles *1a* and *2a* 8.

Opisthosoma with 47 dorsal annuli, 55 ventral annuli. Annuli with rounded microtubercles; those on the ridge and furrow larger and flattened; last ventral annuli with microtubercles elongated.

Setae *c2* 27 long, located on 10th ventral annulus from coxae II; tubercles *c2* 50 apart; ventral setae *d* 30 long, located on 22nd ventral annulus; tubercles *d* 30 apart; setae *e* 16 long, located on 32 ventral annulus; tubercles *e* 15 apart, 7 microtubercles present between tubercles *e*; setae *f* 22 long, located on 51st ventral annulus, 5th annulus from the rear; tubercles *f* 24 apart, 13 microtubercles present between tubercles *f*.

Setae *h1* 4 long, 5 apart; setae *h2* 9 apart; distance between *h1* and *h2* – 2.

Setae *3a* 13 long, 6 apart.

ETYMOLOGY

The specific name is derived from the "Bory Tucholskie" Forest, its type locality.

HOST PLANT

Festuca altissima ALL. (*Poaceae*).

Relation to host plant: the mites are vagrants on the upper leaf surface; no visible damage to the plant was observed.

TYPE MATERIAL

Holotype female (499AB12), 11 female paratypes (499AB4-499AB11, 499AB13, 499AB14), 6 male paratypes (499AB3-499AB8), 1 nymph paratype (472AB6) in the collection of Department of Animal Taxonomy and Ecology, A. Mickiewicz University, Poznań, Poland.

Type locality: Poland, "Cisy Staropolskie im. Leona Wyczółkowskiego" Nature Reserve near Wierzchlas, Bory Tucholskie Forests, 6.06.2000, leg. J. BŁOSZYK.

DIFFERENTIAL DIAGNOSIS

Abacarus tucholensis is the most similar to *A. hystrix* in its elongate-triangular prodorsal shield, with elongated, acute frontal lobe, length of prodorsal shield (50 µm in both species), length of tibia I (8,5 µm in both species), tibia II (7 µm in both species), tarsus I (7 µm in *A. tucholensis*, 8 µm in *A. hystrix*), tarsus II (7 µm in both species), solenidion I (10 µm in *A. tucholensis*, 9 µm in *A. hystrix*), length of genital parts (15 µm in *A. tucholensis*, 16 µm in *A. hystrix*), width of genital parts (21 µm in both species).

A. tucholensis may be distinguished from *A. hystrix* by the the length of dorsomedian ridge, shape of dorsal microtubercles, shape of solenidion and number of opisthosomal annuli. Females of the newly described species have short dorsomedian ridge, ending near 14-15 dorsal annulus, large and subrounded dorsal microtubelcles on the ridge and furrow, solenidia with a small knob at the end, various number of dorsal and ventral annuli (56 and 74 respectively). In the female of *A. hystrix* the dorsomedian ridge is longer, microtubercles on dorsal annuli are suppressed or absent, solenidia are tapering, dorsal annuli about as numerous as ventral (65-66). These two species differ also in the length of ventral setae *d* (71 µm in *A. tucholensis*, 36 µm in *A. hystrix*) and in shield pattern. In *A. tucholensis* the median line is always present on the posterior part of the shield and sometimes splitting or divided into two lines, admedian lines diverging to the lateral margin of the shield. In *A. hystrix* admedian lines do not diverge to the lateral margin and usually there is not median line.

REMARKS

Because the original description of *A. hystrix* published by NALEPA in 1896 is incomplete, description by KEIFER (1944) was used for differential diagnosis.

Three species of the genus *Abacarus* are known to occur on plants of the family *Poaceae* in Poland: *A. hystrix, A. acutatus,* (BOCZEK et al. 1976; SKORACKA & BOCZEK 2000a) and *A. tucholensis* n. sp. The most numerous and frequent is *A. hystrix*, it has been reported from 37 species of wild and cultivated grasses up to date (BOCZEK et al. 2000). *A. acutatus* occurs frequently associated with *Calamagrostis epigeios* (L.) ROTH. and *C. arundinacea* (L) ROTH. (SKORACKA 2000). *A. tucholensis* was found only on *Festuca altissima* in the Bory Tucholskie Forests.

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REFERENCES

AMRINE J., W. JR., 1996., Keys to the world genera of the *Eriophyoidea* (*Acari*: *Prostigmata*). Indira Publ. House, West Bloomfield, Michigan, USA, 187 pp.

AMRINE J., W. JR, STASNY, T.A., 1994., Catalog of the *Eriophyoidea* (*Acarina*: *Prostigmata*) of the World. Indira Publ. House, West Bloomfield, Michigan, USA, 798 pp.

AMRINE, J. W. JR., MANSON, D. C. M., 1996., Preparation, mounting and descriptive study of Eriophyoid mites. In: E.E. LINDQUIST, M.W. SABELIS, J.BRUIN (Editors) – Eriophyoid Mites – Their Biology, Natural Enemies and Control. Elsevier Science Publ., Amsterdam, The Netherlands, pp: 383-396.

AMRINE, J. W. JR., DE LILLO, E., Computer database, in prep.

BOCZEK, J., 1964. Studies on eriophyid mites of Poland. III. Ann. Zool., **22**(11): 221-236.

BOCZEK, J., CHYCZEWSKI, J., DE LUSTGRAFF, B., 1976. Studies on the morphology of some eriophyid mites (*Acarina*: *Eriophyoidea*) of grasses and of garlic. Roczn. Nauk Roln., E, **6**, 1: 41-57.

BOCZEK, J., SKORACKA, A., SKORACKI, M., 2000. Occurrence of *Abacarus hystrix* (Nal.) (*Acari: Eriophyoidea*) on grasses in Poland. Progress in Plant Protection, **40**(2): 502-505. (in Polish)

JEŻEWSKA, M., WIECZOREK, M., 1998. New viruses occuring on wheat plants in Poland. Progress in Plant Protection, **38**(1): 93-100. (in Polish)

KEIFER, H. H., 1944. Eriophyid Studies. Bull. Calif. Dept. Agri., **33**, 1: 28.

LINDQUIST, E. E. 1996., External Anatomy and Notation of Structures. In: E.E. LINDQUIST, M.W. SABELIS, J.BRUIN (Editors) – Eriophyoid Mites – Their Biology, Natural Enemies and Control. Elsevier Science Publ., Amsterdam, The Netherlands, pp: 1-30.

NALEPA, A., 1896. *Callynttrotus hystrix* n. sp. Neue Gallmilben. Anzeiger der kaiserlichen Akademie Wissenschaften. Mathematische-naturwissenschaftliche Klasse, Wien. 33(10): 110.

SHI, A., BOCZEK, J., 2000. Studies on Eriophyoid Mites (*Acari*: *Eriophyoidea*). XXXIX. Bull. Pol. Acad. Sci. **48**(4): 319-331

SKORACKA, A., 2000. Appearance and feeding preferences of eriophyoids mites (*Acari; Eriophyoidea*) on grasses in Poland. Materiały XXVI Sympozjum Akarologicznego: 333-339.

SKORACKA, A., BOCZEK, J., 2000a. *Novophytoptus glyceriae* sp. n. and *N. ammophilae* sp. n., new species of eriophyoid mites (*Acari: Eriophyoidea*) from grasses. Acarina, **8** (2): 95-101.

SKORACKA, A., BOCZEK J., 2000b. Eriophyoid mites (*Acari: Eriophyoidea*) on cereals and the other grasses. Postępy Nauk Rolniczych, 2: 53-69. (in Polish)