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**


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 *lb* 10 (9-11) apart, setae *lb* 11 (8-14) long; tubercles *la* 8 (7-8) apart, setae *la* 29 (21-30) long; tubercles *2a* 22 (19-22) apart, setae *2a* 52 (42-
1. *Abacarus tucholensis* sp.n. – dorsal aspect of a female
long; distance between tubercles $1b$ and $1a$ 8 (7-9), distance between tuber-
cles $1a$ 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; microtubercles 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: leg I (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 (21st-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 o (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 o 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 microtubercules, 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 microtubercules present between tubercles d; setae e (27-38) long, located on (37th-39th) ventral annulus; tubercles e (16-17) apart, (12-14) microtubercules 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) microtubercules 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 beginning 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 Ib 11 apart; tubercles Ia 10 apart, setae Ia 13 long; tubercles 2a 17 apart; distance between tubercles Ib and Ia 9, distance between tubercles Ia 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.
A NEW SPECIES OF ERIOPHYOID MITE

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.


DIFFERENTIAL DIAGNOSIS
Abacarus tucholensis is the most similar to A. hystric 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. hystric), tarsus II (7 µm in both species), solenidion I (10 µm in A. tucholensis, 9 µm in A. hystric), length of genital parts (15 µm in A. tucholensis, 16 µm in A. hystric), width of genital parts (21 µm in both species).

A. tucholensis may be distinguished from A. hystric 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 microtubcleles 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. hystric 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. hystric) 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. hystric admedian lines do not diverge to the lateral margin and usually there is not median line.

REMARKS
Because the original description of A. hystric 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. hystric, A. acutatus, (Boczek et al. 1976; Skoracka & Boczek 2000a) and A. tucholensis n. sp. The most numerous and frequent is A. hystric, 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.
ACKNOWLEDGMENTS

I am grateful to Dr. hab. J. Błoszyk, Department of Animal Taxonomy and Ecology, for collecting samples of *F. altissima*. I am indebted to Prof. J. Boczek, Department of Applied Entomology, Warsaw, to Dr. Wojciech Magowski and Dr. Ziemowit Olszanowski, A. Mickiewicz University, for their comments on the manuscript.

The study was supported by the State Committee for Scientific Research (research grant No. 6 P04 C0 5418).

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