# Eriophyoid mites from grasses in Poland (Acari: Eriophyoidea)

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ABSTRACT. In the years 1998-2001 the occurrence of eriophyoid mites on grasses was studied in Poland. The survey showed that the grass-inhabiting eriophyoid fauna is represented in Poland by six genera and 29 species. Nine of the species have been described as new to science, i.e. *Aceria absentia*, *Aceria erecti*, *Aceria flexuosae*, *Aceria glomerivagrans*, *Aceria nardusi*, *Aceria stipaespinulata*, *Aculodes holcusi*, *Aculodes multitricavus* and *Jaranasia sesleriae*; and four have been recorded in Poland for the first time, i.e. *Aceria anthocoptes* (NALEPA), *Aceria aculiformia* SUKHAREVA, *Aceria calamagrostis* SUKHAREVA, *Aceria taurica* MITROFANOV et SHARONOV. The known species have been redescribed and supplemented. Males, nymphs and larvae of *Aceria aculiformia*, *Aceria eximia* SUKHAREVA, *Aceria tosichella* KEIFER, *Abacarus acutatus* SUKHAREVA, *Abacarus hystrix* (NALEPA), *Aculodes dubius* (NALEPA), *Aculodes mckenziei* (KEIFER) have been described for the first time. A key to determination of females of grass-inhabiting Eriophyoidea in Poland has been given. The information about host plants, feeding habits, distributions and plant injuries caused by mites have been provided. To determine the degree of mite infestation on grasses the values of its prevalence, intensity and density have been calculated. On the basis of mite infestation, classes of mite specificity (specialists I, specialists II and generalists) and classes of hosts (accidental, accessory and specific) have been adopted. Grass-inhabiting eriophyoids in Poland may have host specificity varying from narrow to extreme. About 60% of species are specialists I limited to one host species, about 20% are either specialists II which live on two or three host species and generalists which have broad host range. The most widely distributed and abundant eriophyoids on grasses in Poland were: *Abacarus hystrix*, *Aculodes mckenziei* and *A. dubius*.

Key words: Acari, Eriophyoidea, grasses, infestation, morphology, new genus, new species, Poaceae, Poland, taxonomy.

CONTENTS

## 1. INTRODUCTION

The superfamily Eriophyoidea includes three families: Phytoptidae, Eriophyidae and Diptilomiopidae (LINDQUIST & AMRINE 1996). According to AMRINE (1996), over 3030 species are known and each year several new genera and over 100 new species are described. AMRINE (1996) estimated that in tropical regions fewer than 5% of species have been described up to date and the eventual eriophyoid world fauna may contain from 35 000 to 50 000 species. In Poland the taxonomical and faunistic studies on eriophyoid mites were undertaken by BOCZEK (1961) and presently there are known about 330 eriophyoid species (AMRINE & STASNY 1994, SKORACKA & BOCZEK in prep.).

Eriophyoid mites are obligatory phytophages and infest all plant parts, except the roots. They occur widely on flowering and coniferous plants and ferns throughout the world, and are known from over 1800 plant species of nearly 200 families. Many species are of great economic importance, because of the abnormalities which they induce on plants or the plant viruses they transmit. Most of them are quite host specific, the majority of species described to date being reported from single host species, and many being limited to host species within a single genus (OLDFIELD 1996). A few others, such as *Abacarus hystrix* (NALEPA) and *Calacarus citrifolii* KEIFER have a wide host range (SMITH MEYER 1981, AMRINE & STASNY 1994). Eriophyoid mites also specialise in their selection of plant tissue. All feed on living tissue of their hosts. However, some live on the surface of leaves or fruit, others inside buds or leaf sheaths. Some cause the formation of various kinds of galls which they inhabit (OLDFIELD 1996).

Over 130 species of eriophyoid mite species have been found up to date on grasses (AMRINE & STASNY 1994, SKORACKA & BOCZEK 2000a, 200b, HUANG 2001a, 2001b, 2001c, SKORACKA 2001, 2002, 2003). Some of them cause economically significant damage to their hosts through direct injury or transmission of plant diseases. However, many aspects of their morphology and taxonomy are still poorly understood. The males and immature stages of many species have not been described and studied morphologically. The taxonomy of the genus *Aceria* KEIFER, in particular, is in urgent need of revision. Information about ecology of grass-inhabiting eriophyoids is also scarce. The extent of host-specificity among grasslands eriophyoids, for example, is not well understood (FROST & RIDLAND 1996, NUZZACI & DE LILLO 1996). Even though extensive studies on grass-infesting eriophyoids have been conducted in Poland since 1998 (SKORACKA & BOCZEK 2000a, KOZŁOWSKI 2001, SKORACKA & KOZŁOWSKI 2002), there is a lack of a summarising report. This paper is intended to fill this gap and presents the results of the four-years survey conducted on cultivated and wild grasses in Poland. The aims of the study were to: 1) determine the eriophyoid mites species, 2) make a complete morphological characteristics of the adults and juvenile stages of eriophyoids, 3) make a key to determine of females, 4) analyse the parameters of infestation of mites and define their host specificity.

## 2. REVIEW OF STUDIES ON GRASS-INFESTING ERIOPHYOID MITES

The most extensive and intensive studies on grass-inhabiting eriophyoid mites have been conducted in Europe and North America. Some observations were also made in Africa, Australia, New Zealand, India, Taiwan, Thailand, the Philippines and China. To date, about 130 species have been described. The majority of them are vagrants on leaves. Many live in leaf sheaths, under leaf ligules, on inflorescences, and a few species inhabit galls (AMRINE & STASNY 1994, FROST & RIDLAND 1996, FLECHTMANN 2000, SKORACKA & BOCZEK 2000a, 2000b, HUANG 2001a, 2001b, 2001c, SKORACKA 2001, 2002, 2003, CHANDRAPATYA & BOCZEK 2002).

Most of the grass-infesting species do not cause significant injury to their hosts. However, feeding of several of them induces growth malformations, e.g. the shortening of shoots or internodes, the twisting and the rolling of leaf edges and plant tips, growth inhibition, stunting, rusting, browning, production of spots or other discoloration of leaves, sterility, witches' broom, galls on leaves or flowers. Furthermore, four species are known as vectors of plant diseases (AMRINE & STASNY 1994, FROST & RIDLAND 1996). Amongst them, two: wheat curl mite, *Aceria tosichella* KEIFER and cereal rust mite, *Abacarus hystrix* (NALEPA) are notable as significant pests causing the most serious economic losses in cultivated grasslands. *A. tosichella* is a vector of the wheat streak mosaic virus and the wheat spot mosaic virus. *A. hystrix* transmits the ryegrass mosaic virus and the agropyron mosaic virus. Both species are common in permanent and ley pastures throughout Holarctic, Ethiopian and Australian regions, and are found on economically significant grasses, e.g. wheat, barley, oats, maize, millet, rye, ryegrass, thimothy (OLDFIELD & PROESELER 1996).

The main goals of studies on grass-inhabiting eriophyoids conducted up to date have been to determine and list the eriophyoid fauna and their host plants (CONNIN 1956, PROESELER 1972, GUY 1993, AMRINE & STASNY 1994, GUY & GOULD 1996) and to estimate the mites' harmfulness and their role as pests. Many field and laboratory experiments allow to: assess the role of *A. tosichella* and *A. hystrix* as vectors of plant viruses, understand the factors that facilitate their dispersal, and test the influence of chemicals on mites spreading (PAINTER & SCHESSER 1954, SLYKHUIS 1955, 1961, 1969, MULLIGAN 1960, NAULT & BRIONES 1961, ORLOB 1966, NAULT et al. 1967, CATHERALL & CHAMBERLAIN 1975, GIBSON 1976, 1981, GIBSON & PLUMB 1976, HARVEY & SEIFERS 1991, GUY 1993, SALM et al. 1994, KOZŁOWSKI 2000, SÁNCHEZ-SÁNCHEZ et al. 2001). Many observations on methods of identification of WSMV in cereals (SÁNCHEZ-SÁNCHEZ et al. 2001) and of rapid and reliable detection of WSMV in mites (MAHMOOD et al. 1997) have been carried out. The progress in genetic methods permits the testing of the resistance of wheat to *A. tosichella* and wheat streak mosaic virus (HARVEY et al. 1995, TALBERT et al. 1996).

Data about biology and ecology of grass-infesting eriophyoid mites are still scarce. There is little information about host specificity and selectivity of plants. Most of the observations resulted in listing the host plants for a given eriophyoid

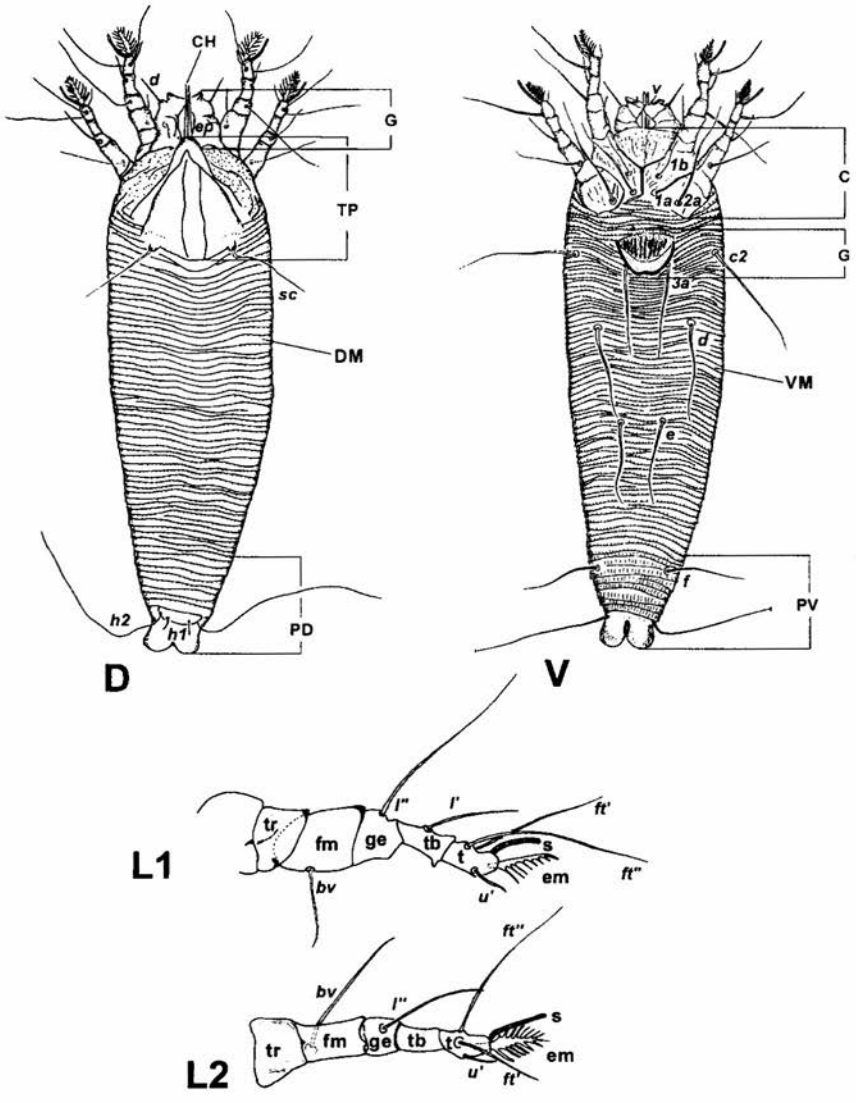
species (CONNIN 1956, NAULT & STYER 1969, PROESELER 1972). So far, a limited number of studies on eriophyoid mites' prevalence and intensity of infestation (KOZŁOWSKI 2000, 2001, SKORACKA 2002) and on spatial distribution of mites on their host plants (GIBSON 1974, HARVEY & MARTIN 1980, SKORACKA et al. 2002) have been made. The population dynamics of only five eriophyoid species have been studied in detail: *A. hystrix, A. tosichella, Aculodes mckenziei* (KEIFER), *Aculodes dubius* (NALEPA) (GIBSON 1976, NAULT & STYER 1969, PROESELER 1972, GILLESPIE et al. 1998) and *Aculus bambusae* KUANG (ZHANG et al. 2001). Similarly, observations on the life-history parameters of only three grass-infesting eriophyoid species: *A. hystrix, A. tosichella, A. mckenziei* (ROSARIO & SILL 1964, BOCZEK & CHYCZEWSKI 1975) have been made. Furthermore, little is known about relationships between grass-inhabiting eriophyoid mites and their natural enemies. MCCOY (1996) stated that fungi of the genera *Verticillium* and *Hirsutella* may attack *A. hystrix* and are responsible for about 16% mite morality. ZHANG et al. (2001) indicated the role of *Typhlodromus bambusae* EHARA (Phytoseiidae) as a predator of *A. bambusae*.

In Poland extensive studies on the eriophyoid mites inhabiting grasses were undertaken in 1998. Up to that year, only four grass-infesting eriophyoid species were known, i.e. *A. hystrix, A. mckenziei, A. dubius, Aceria tenuis* (NALEPA) (BOCZEK et al. 1976). In 1997, during a period of study on wheat infestation with virus diseases, the presence of *A. tosichella* and wheat streak mosaic virus on wheat was first found (JEŻEWSKA & WIECZOREK 1998). Then, observations on the intensity of infestation and the role of *A. tosichella* and *A. hystrix* as vectors of grass viruses in Poland were carried out (KOZŁOWSKI 2000; SKORACKA & MAGOWSKI 2002). In the years 1998-2001 the occurrence of eriophyoid mites on grasses in Poland, mostly in the Wielkopolska region, were studied. As a result 16 mite species have been reported (SKORACKA & BOCZEK 2000a, 2000b; SKORACKA 2000, 2001, 2002, 2003; KOZŁOWSKI 2001; SKORACKA & KOZŁOWSKI 2002).

## 3. MORPHOLOGICAL CHARACTERISTIC, NOTATION OF STRUCTURES AND CHARACTERS USED IN SYSTEMATICS

The superfamily Eriophyoidea is characterised by having only two pairs of legs in each developmental stage and the lack of respiratory system and eyes. The body length ranges from 80 to nearly 500 μm. The body consists of a gnathosoma and an idiosoma. The anterior part of idiosoma bears legs and is covered by a prodorsal shield. The posterior part of idiosoma is elongated and called the opisthosoma (Fig. 1).

The gnathosoma includes pedipalps, cheliceral stylets, stylet-like structures and associated structures (Fig. 1). There is a lack of dorsal shield – stylophor. However, the ventral one – infracapitulum is present and its dorsomedian surface has a longitudinal channel called the stylet sheath. This channel is deeply U-shaped in cross section and contains seven or nine stylet-like structures: a pair of cheliceral stylets, oral stylet, a pair of auxiliary stylets, and in some taxa (particu-




1. Morphological characteristics of eriophyoid female: D – dorsal aspect: CH – chelicerae, DM – dorsal annuli, G – gnathosoma, PD – postero-dorsal opisthosoma (telosome), TP – prodorsal shield, *d* – subapikal seta, *ep* – palpcoxal seta, *h1* – accessory seta, *h2* – caudal seta, *sc* – scapular seta; V - ventral aspect: C – coxal region, G – genital region, PV – postero-ventral opisthosoma (telosome), VM – ventral annuli, *1a* – proximal seta on coxisternum I, *1b* – anterolateral seta on coxisternum I, *2a* – proximal seta on coxisternum II, *3a* – genital seta, *c2* – lateral seta, *d* – 1st ventral seta, *e* – 2nd ventral seta, *f* – 3rd ventral seta, *v* – sensory peg; L1, L2 - legs I and II: em – empodium, s – solenidion, fm – femur, ge – genu, t – tarsus, tb – tibia, tr – trochanter, *bv* – basiventral femoral seta, *ft'* – paraxial, fastigal tarsal seta, *ft''* – antaxial, fastigal tarsal seta, *l'* – paraxial tibia seta, *l''* – antaxial genual seta, *u'* – paraxial, unguinal tarsal seta.

larly in the Phytoptidae and Diptilomiopidae) a pair of freely projecting apices of guide-like structures. The cheliceral stylets penetrate leaf tissue and are activated by a small knob lying between their base – the motivator. In the Phytoptidae and Eriophyidae stylets are small or moderate in size (15-40 μm) and slightly curved. However, in Diptilomiopidae stylets are longer (50-70 μm), more robust, with an abruptly bent base. The auxiliary stylets, along with the oral stylet, function in feeding by channelling secretions from salivary glands (KEIFER 1975, LINDQUIST 1996).

Pedipalps consist of a base and three other segments. The dorsal surface of a base bears a palpcoxal seta (*ep*) and flexible spinelike process directed paraxially over the cheliceral stylets, called the cheliceral retainer. The first, proximal segment is the largest and appears to be a consolidation of trochanter, femur and genu. It bears a subapikal seta *d*. The second segment and apical segment (palptibia and palptarsus, respectively) are shortened and wider than long. The palptarsus bears a short seta-like structure, called sensory peg *v* (Fig. 1) (LINDQUIST 1996). Its distal surface is truncated, that has an adhesive function. During feeding the apices of pedipalps are adhered to the leaf surface and the tarsal and tibial segment telescope or buckle into one another to allow deeper penetration of the stylets into plant tissue (WESTPHAL & MANSON 1996).

The prodorsal shield may be triangular, subtriangular, rhomboidal, oval or semicircular in shape, and may have an anteromedian extension over the base of the chelicerae, called frontal lobe. The shield may be nearly smooth or ornamented with various patterns (LINDQUIST 1996). The sculpture of the shield may reflect in part the pattern of the position of muscle insertions on the inner surface of the shield, and also may provide a framework of strength to the shield (SHEVCHENKO 1970). The sculpture is an effect of the variously situated grooves and ribs forming linear patterns. The lines have descriptive terms, including the median line that runs longitudinally along the midline, admedian lines situated on either side of the median line, and series of submedian lines, which flank the admedian lines and vary in number (LINDQUIST 1996). These lines may not be developed in either the larval and nymphal instars, or the adult of female deutogyne (MANSON & OLDFIELD 1996). The prodorsal shield may bear any combination of setae from zero to five, as follows: the unpaired anteromedial seta *vi* situated near the top of the shield; the paired anterolateral setae *ve* situated on the anterior half of the shield; the paired posterolateral setae *sc* situated on the posterior half of the shield. The presence of one, three, four or five prodorsal setae is restricted to genera of Phytoptidae, and depends on the presence of either *vi* seta or *ve* setae, or both. The presence of one pair of scapular setae *sc* is restricted to the Eriophyidae (Fig. 1) and Diptilomiopidae. Although the prodorsal setae do not change in number during development from larva to adult in a given taxa, their position and orientation often do. The larvae of many species have the bases of setae *sc* located well ahead from the posterior margin of the shield, and setae are directed dorsoanteriorly. However, the adults have the bases of setae *sc* located on the rear shield margin, and setae are directed posteriorly.

The opisthosoma of Eriophyoidea is elongated and wormlike, and its surface consistently bears a series of transverse rings or annuli in all active instars (Fig. 1). In adults, the form of the body is generally distinguished as being either "vermiform" or "fusiform" in descriptions and keys. Vermiform mites have a flexible, elongated, unarched aspect with numerous, narrow annuli that are differentiated little, if any, from dorsum to venter. Fusiform mites have a dorsally arched, less elongated aspect, with a series of fewer, thicker and less flexible structures dorsally than ventrally. Dorsal annuli assume a great variety of forms, including ridges, furrows, and projections. The opisthosomal annuli of many eriophyoid taxa have whorls of microtubercles, that may be rounded, elongated, conical, pointed, etc. (LINDQUIST 1996). Their presence, size and shape are correlated with mites' mobility and water loss (SHEVCHENKO 1970, KEIFER 1975). The maximum seven pairs of opisthosomal setae are present. The great majority of eriophyoids have six pairs, but a few have five or four pairs of opisthosomal setae. The subdorsal setae *c1* are found only among some genera of Phytoptidae. The other six pairs are relatively stable (LINDQUIST 1966) and are suggested to play a role both in tactile sweeping of adjacent surfaces and in aerodynamic lifting during aerial dispersal (SHEVCHENKO 1970). The lateral setae *c2* are inserted on lateral surfaces of opisthosoma. On the ventral side of the body there are three pairs of ventral setae: I - *d*, II - *e*, III - *f*. On the dorsal side of the posterior part of opisthosoma there are two pairs of setae: caudal *h2* and accessory *h1*.

The posterior part of opisthosoma is called telosome (Fig. 1). It contains 3-8 annuli and not annulated, musculated terminal lobes between which lies the anus (LINDQUIST 1996). The lobes function, apparently with anal secretions, as an adhesive organ, or anal sucker, which attaches to the substrate during such various activities as moulting, feeding, moving, dispersal and deposition or acquisition of spermatophores (SHEVCHENKO 1970).

The anterior part of the ventral idiosoma is covered by coxisternal plates and called the coxisternal region (Fig. 1). Coxisternal plates I commonly are continuous medially, such that their anterolateral margins embrace the infracapitulum. A median line of union between these plates, called the sternal line, may be present. Coxisternal plates II are separated from each other medially by the posterior margin of plates I and by at least a few ventral annuli, and are more widely spaced than plates I. The coxisternal plates (coxisternum) typically and maximally bear three pairs of setae. Two pairs of setae: proximal setae *1a* and anterolateral setae *1b* are inserted on coxisternum I and may vary considerably in presence, size and position in various taxa of Eriophyoidea. The one pair of proximal setae *2a* is inserted on coxisternum II, and is present in all known taxa of Eriophyoidea.

The genital region of adults of both sexes is located below the coxisternal region. The genital opening is wider than long and described as being transverse. In females the progenital chamber is covered by a single, subtriangular or subelliptical flap or epigynium, which is hinged anteriorly to the body surface (Fig. 1). The epigynium may be smooth or covered by striae or granules. The

progenital chamber is anteriorly framed by a pair of internal, chitinous apodemes. A median gonopore leads from the center of the genital opening to a pair of spermathecal tubes, or ducts, that lead to the spermathecae (Fig. 3 - IG). In males the progenital chamber is bordered anteriorly by a transverse, somewhat curved margin or ridge that may be an abbreviated equivalent of the female coverflap. Near the opening a pair of minute structures – the eugenital setae are evident (Fig. 6 - CGM). A pair of *3a* setae flanking the genital opening in adults of both sexes is present (Figs 1, 6 - CGM). No rudiments of genital opening is evident in the larva and nymph, however the setae *3a* are present (Figs 7 - CN, 8 - CL).

Eriophyoids have two pairs of legs in both adult and immature stages. Legs usually have five articulating segments, namely: trochanter, femur, genu, tibia and tarsus (Fig. 1) (LINDQUIST 1996). The representatives of the genus *Cymeda* MANS. et GERS. have two segmented femora (MANSON & GERSON 1986). In a few taxa tibia and tarsus may be partly to completely fused. The primitive and maximal number of setae of the leg I is six and of the leg II is five. The formula of setae on each segment of the leg I, beginning from the trochanter is: 0-1-1-1-3. The maximal setal complement of the leg II is the same except for the absence of the tibial seta (0-1-1-0-3). The femoral seta is inserted ventrally and denoted *bv*. The genual seta *l''* is inserted dorsally or dorsolaterally, and is generally the largest of the setae on leg I. The tibial seta *l'* is inserted dorsally, and present only on leg I. The tarsus bears three pairs of setae: dorsolaterally inserted *ft'* and *ft''*, anteroventrally inserted *u'*. The tarsi of leg I and II bear terminal structures, i.e. solenidia and empodial claws. Solenidion $\omega$ is inserted dorsodistally, is usually curved and slightly enlarged or knobbed apically. In various genera of Phytoptidae, leg I has a second solenidion $\varphi$, inserted posterolaterally near the ventral apex of the tibia. The empodium, called the featherclaw, is branched into few to many rays, which in turn are usually secondarily branched and end in enlarged tips.

In Eriophyoidea there is no pronounced sexual dimorphism. The females and males differ from each other only in the appearance of the genital opening. Larvae and nymphs differ from adults in size, lacking genitalia, smaller numbers of opisthosomal annuli, shortest setae, less ornamented prodorsal shield and smallest number of empodial rays. Larvae may differ from other stages in position and direction of setae *sc* (LINDQUIST 1996).

Characters thought to be significant at the family level in eriophyoid mites include: degree of development and form of the gnathosoma, number of setae on the prodorsal shield (particularly the presence of one or more of the anterior setae *vi* or *ve*), length and orientation of the spermathecal tubes. Characters thought to be significant at the generic level include: condition of the anterior lobe of prodorsal shield, presence of the setae *sc*, position of the base of setae *sc*, direction of *sc* setae on the prodorsal shield, presence of a subdorsal pair of setae *c1* on opisthosoma, general form of opisthosoma, shape of opisthosomal dorsal annuli (particularly the presence of dorsal opisthosomal ridges or furrows), location, size and ornamentation of the female genital coverflap, consolidation of the

tibia and tarsus or of the genu and femur on the legs, presence of the tibial solenidion $\varphi$, major modification of the tarsal empodia. Characters thought to be significant at the species level include: dimensions of the dorsal ridge, shape of the frontal lobe of prodorsal shield, ornamentation of the prodorsal shield, condition of the sternal line, shape of the microtubercles, dimensions of the body structures (LINDQUIST & AMRINE 1996).

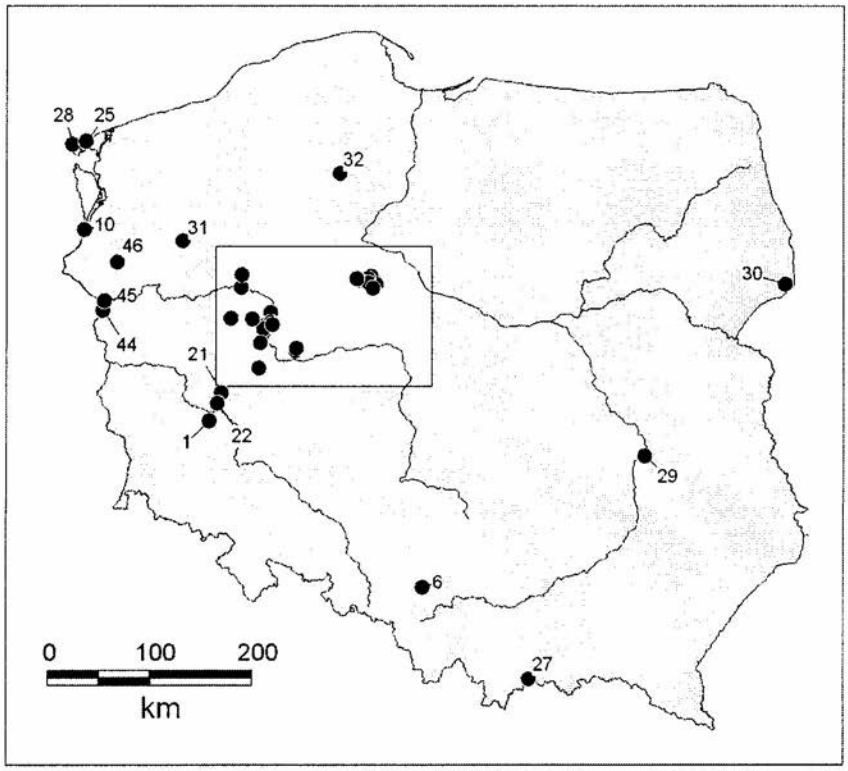
## 4. MATERIAL AND METHODS

### 4.1. STUDY AREA AND MATERIAL

Material was collected from August 1998 to August 2001 in Poland, from 115 localities (Fig. 2), which are listed and characterised in Table 1. The material included 791 samples, 495 (63%) of which were effective. Each sample consisted of 10 individual shoots of a given grass species, collected randomly from the sampling locality. Shoots were cut just above the ground and put into a plastic bag. Plants were carried to the laboratory and preserved in the refrigerator, maximally one week. Then, grasses were identified (FALKOWSKI 1982, SZAFER et al. 1986, RUTKOWSKI 1998) and thoroughly examined with stereomicroscope. Mites were counted, collected and mounted in Heinze medium (BOCZEK 1994), and subsequently studied with a phase-contrast microscope. The generic classification follows that of AMRINE (1996) and that of the species on the original descriptions (NALEPA 1891, 1892, 1896, KEIFER 1944, 1969, SUKHAREVA 1972, 1977, 1983, 1985, 1986, MITROFANOV et al. 1988). Mites new for science were described. Descriptions of known species were supplemented. There were measured and characterised about 108 traits per specimen. Nomenclature of morphology follows that of AMRINE (1996) and LINDQUIST (1996). Measurements were made according to AMRINE & MANSON (1996); all are given in micrometers. Measurements of legs segments and setae refer to the length of the structure. Positions of legs' setae were measured from proximal margin of a given segment. Ventral annuli were counted from the posterior margin of coxae II. Each measurement of holotype precedes the corresponding range for paratypes.

The results presented in this paper are based on analysis of 200 960 specimens representing 27 species of the Eriophyidae and Phytoptidae. The examined material is kept in the collection of Department of Animal Taxonomy and Ecology, Adam Mickiewicz University, Poznań, Poland.

2. Sampling areas (see map on right page). Legend (for localities see Table 1): 1- localities near Głogów; 2 - Brody near Poznań; 3 - Poznań, Poetów district; 4 - Poznań, Lasek Marceliński forest; 5 - Biedrusko, military area; 6 - Katowice; 7 - Poznań, Cytadela park; 10 - Zatoń Dolna; 13 - Słupia Wielka near Środa Wlkp.; 14 - Poznań, Łęgi Dębińskie forest; 15 - Koszuty near Środa Wlkp.; 16 - Wielkopolski National Park; 20 - Obrzycko; 21 - Lgiń near Wschowa; 22 - Leśna Dolina near Głogów; 23 - Tarnowo Podgórne; 25 - Międzyzdroje; 26 - Poznań, Warta riverside; 27 - Pieniny Mts., Beskid Sądecki Mts.; 28 - Świnoujście; 29 - Kazimierz; 30 - Białowieża; 31 - Drawieński National Park; 32 - Bory Tucholskie forest; 33 - Choryń; 34-42 - Kujawy: 34 - Mątwy; 35 - Jacewo; 36 - Dulsk; 37 - Janikowo; 38 - Góra; 39 - Inowrocław; 40 - Szarlej; 41 - Pakość; 42 - Ciechocinek; 43 - Lubasz; 44 - Owczary; 45 - Słońsk; 46 - Myślibórz Lake District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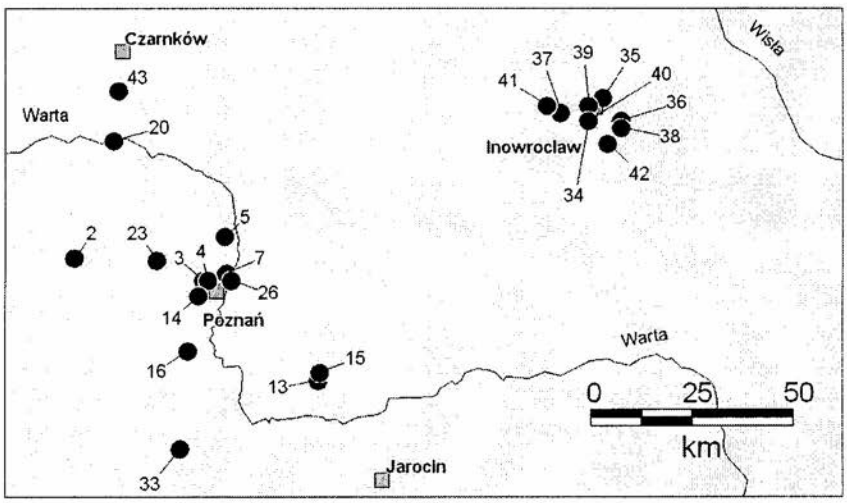
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Abbreviations of localities (in square parentheses) are explained in Table 1. In the list of "other records" of mites the abbreviations of localities are followed

Table 1

The list and characteristics of localities. Legend: 1 - locality abbreviations, 2 - localities, 3 - geographical co-ordinates, 4 - habitats, 5 - abbreviations of grass species collected

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| [BIA1] | Białowieża (30 - refer to the sampling area, Fig. 2) | 23°51' E 52°44' N | forest path | CALcan, DACglo, DEScae, FESaru, MELuni, POAnem |
| [BIA2] | Białowieża (30) | 23°51' E 52°44' N | marshy meadow | GLYmax, PHRaus |
| [BRP1] | Brody near Poznań (2) | 16°23' E 52°26' N | pasture no 1 | AGRrep, BROhor, FESrub, LOLper, POAann |
| [BRP2] | Brody near Poznań (2) | 16°23' E 52°26' N | path near a field under potato cultivation | BROcar, SETvir |
| [BRP3] | Brody near Poznań (2) | 16°23' E 52°26' N | park | POAnem |
| [BRP4] | Brody near Poznań (2) | 16°23' E 52°26' N | pasture, near a stream | PHAaru |
| [BRP5] | Brody near Poznań (2) | 16°23' E 52°26' N | wet pasture | ALOpra, GLYflu, POApal |
| [BRP6] | Brody near Poznań (2) | 16°23' E 52°26' N | pasture no 2 | AGOcan, AGOcap, AGOsto, APEspi, ARRela, BRApin, BROine, DACglo, DACpol, DEScas, ECHgal, FESaru, FESpra, LOLmul, LOLper, MELuni, PHAaru, PHLpra, POApra |
| [BSP1] | Beskid Sądecki Mts.; Przechyba, 1173 asl (27) | 20°24' E 49°26' N | meadow | BROhor, NARstr |
| [BSP2] | Beskid Sądecki Mts.; track to Przechyba (27) | 20°24' E 49°26' N | leafy forest | CALaru, FESgig, GLYflu, MELnut |
| [BSP3] | Beskid Sądecki Mts.; Przechyba, 1173 asl (27) | 20°24' E 49°26' N | mountain meadow, south exposition | HOLmol |
| [BWP] | Beskid Wyspowy Mts.; Paleśnica (27) | 20°45' E 49°45' N | meadow | FESrub |
| [CHK1] | Choryń near Kościan (33) | 16°46' E 52°01' N | balk | AGRrep, ARRela |
| [CHK2] | Choryń near Kościan (33) | 16°46' E 52°01' N | experimental plot | AGRrep, TRCaes |
| [CIE1] | Ciechocinek (42) | 18°18' E 52°42' N | meadow near former nature reserve | PUCdis |
| [CIE2] | Ciechocinek (42) | 18°18' E 52°42' N | road near a salt graduator | PUCdis |
| [CZE] | Czerników near Myślibórz (46) | 14°51' E 52°55' N | leafy forest | DACpol |
| [DPN] | Drawieński National Park (31) | 15°44' E 53°05' N | leafy forest | MELuni |
| [GLD1] | Leśna Dolina near Głogów (22) | 16°12' E 51°44' N | mixed forest | CALepi, FESrub, POApra |
| [GLD2] | Leśna Dolina near Głogów (22) | 16°12' E 51°44' N | woodland in a mixed forest | ARRela, BROhor, DACglo |
| [GOI] | Góra near Inowrocław (38) | 18°21' E 52°43' N | salt-mine | PUCdis |
| [IN1] | Pakość near Inowrocław (41) | 18°04' E 52°46' N | grazed meadow near a pond | PUCdis |
| [IN2] | Pakość near Inowrocław (41) | 18°04' E 52°46' N | grazed meadow near a water channel | PUCdis |
| [IND] | Dulsk near Inowrocław (36) | 18°21' E 52°45' N | pasture | PUCdis |
| [INJ] | Jacewo near Inowrocław (35) | 18°16' E 52°47' N | meadow | PUCdis |
| [INJA1] | Janikowo near Inowrocław (37) | 18°07' E 52°46' N | roadside | PUCdis |
| [INJA2] | Janikowo near Inowrocław (37) | 18°07' E 52°46' N | fallow | PUCdis |
| [INM] | Mątwy near Inowrocław (34) | 18°13' E 52°45' N | meadow | PUCdis |
| [INR] | Inowrocław (39) | 18°13' E 52°46' N | road near a salt graduator | PUCdis |
| [INS] | Szarlej near Inowrocław (40) | 18°13' E 52°45' N | path in a field under cultivation | PUCdis |
| [KA1] | Kazimierz (29) | 21°57' E 51°18' N | path in a mixed forest | FESgig, GLYflu, LOLper |

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|---|---|---|---|---|
| [KAT1] | Katowice, Tysiąclecia District (6) | 18°58' E 50°12' N | urban park, path near a pond | ALOpra, BROcar, DACglom |
| [KAT2] | Katowice, Tysiąclecia District (6) | 18°58' E 50°12' N | urban park | DEScae |
| [KUG1] | Kurowice near Głogów (1) | 16°06' E 51°36' N | wild, dry meadow | CALepi, FESovi, FESpra |
| [KUG2] | Kurowice near Głogów (1) | 16°06' E 51°36' N | field under barley cultivation | HORvul |
| [KUG3] | Kurowice near Głogów (1) | 16°06' E 51°36' N | field under wheat cultivation | TRCaes |
| [LGW1] | Lgiń near Wschowa (21) | 16°15' E 51°49' N | allotment garden | AGRrep, BROhor, CALepi, LOLper |
| [LUB1] | Lubasz (Wielkopolska) (20) | 16°32' E 52°48' N | meadow near forest margin | CYNcri |
| [LUP] | Rowy, river-side of Łupawa | 17°05' E 55°70' N | natural community of halophytes | PUCdis |
| [ME1] | Międzyzdroje (25) | 14°27' E 53°55' N | littoral dune | AMMare, CALepi, CORcan, ELYare, FESrub |
| [MOG1] | Modła near Głogów (1) | 16°06' E 51°36' N | meadow | HOLlan |
| [MOG2] | Modła near Głogów (1) | 16°06' E 51°36' N | field under wheat cultivation | AGRrep, AGOgig, ARRela, TRCaes |
| [MOG3] | Modła near Głogów (1) | 16°06' E 51°36' N | pinewood margin | CALepi, FESrub |
| [MOG4] | Modła near Głogów (1) | 16°06' E 51°36' N | path near a field under wheat cultivation | AVEsat, POApra, SETvir |
| [MOG5] | Modła near Głogów (1) | 16°06' E 51°36' N | field under barley cultivation | AGRcan |
| [MOS1] | Mosina near Poznań (16) | 16°47' E 52°14' N | coniferous forest margin; dry, sandy soil | ELYare |
| [OP1] | Obrzycko near Poznań (20) | 16°31' E 52°42' N | dry pinewood | DESfle, FESrub |
| [OP2] | Obrzycko near Poznań (20) | 16°31' E 52°42' N | dry meadow near a pinewood | CALepi |
| [OP3] | Obrzycko near Poznań (20) | 16° 31' E 52° 42' N | roadside | FESrub |
| [OP4] | Obrzycko near Poznań (20) | 16°31' E 52°42' N | meadow | AGOcap |
| [OP5] | Obrzycko near Poznań (20) | 16°31' E 52°42' N | riverside | BROhor |
| [OW1] | Owczary, Pamięcin (44) | 14°40' E 52°31' N | xerotherime sward | DESfle, SETvir, STIcap, STIjoa |
| [OW2] | Owczary (44) | 14°40' E 52°31' N | xerotherime sward | BROine, STIcap, TRIfla |
| [PBP1] | Biedrusko near Poznań (5) | 16°55' E 52°29' N | roadside | AGRrep, BROine, LOLper |
| [PBP2] | Biedrusko near Poznań (5) | 16°55' E 52°29' N | meadow, south form Chojnicka Street | AGOcap, AGOgig |
| [PBP3] | Biedrusko near Poznań (5) | 16°55' E 52°29' N | xerothermic meadow | AVNpra, BROine, CALepi, CORcan, ECHcru, SETvir |
| [PBP4] | Biedrusko near Poznań (5) | 16°55' E 52°29' N | woodland | ALOaeq, ANTodo, BROste, CALcan, DEScae, HOLlan, PUCdis |
| [PBP5] | Biedrusko near Poznań (5) | 16°55' E 52°29' N | forest margin near Obornicka Street | AGRrep, CALepi |
| [PBP6] | Biedrusko near Poznań (5) | 16°55' E 52°29' N | forest path at south form Chojnicka Street | AGOcap, AGRrep, CALepi |
| [PBP7] | Biedrusko near Poznań (5) | 16°55' E 52°29' N | south part, near Obornicka Street, meadow | ARRela, BROine, ECHcru, HOLlan |
| [PBP8] | Biedrusko near Poznań (5) | 16°55' E, 52°29' N | meadow near forest margin | AGOcap, CARcan, DACglo |
| [PBP9] | Biedrusko near Poznań (5) | 16°55' E, 52°29' N | road near field under cultivation, at south form Chojnicka Street | AVEsat |
| [PBP10] | Biedrusko near Poznań (5) | 16°55' E, 52°29' N | south part, path in a field under cultivation | BROhor |
| [PBP11] | Biedrusko near Poznań (5) | 16°55' E, 52°29' N | pond | DACglo, DESfle, PHLpra, TRIfla |
| [PC4] | Poznań, Cytadela park (7) | 16°55' E, 52°25' N | moist roadside ditch | AGRrep, BROhor, PHLpra, POApra |
| [PC5] | Poznań, Cytadela park (7) | 16°55' E, 52°25' N | dry, roadside ditch | BROhor, FESrub |
| [PC6] | Poznań, Cytadela park (7) | 16°55' E, 52°25' N | not mowed meadow near the road | AGRrep, ARRela, BROine, CALepi, DACglo, FESaru, PHAaru |
| [PC7] | Poznań, Cytadela park (7) | 16°55' E, | roadside ditch | AGRrep, BROhor, BROste, PHLpra |

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| [PC8] | Poznań, Cytadela park (7) | 16°55' E, 52°25' N | moist ditch near scrub | FESrub |
| [PC9] | Poznań, Cytadela park (7) | 16°55' E, 52°25' N | scrub | ARRela |
| [PC10] | Poznań, Cytadela park (7) | 16°55' E, 52°25' N | bushes | BROste |
| [PC13] | Poznań, Cytadela park (7) | 16°55' E, 52°25' N | scarp with south exposition | AGRrep, ARRela, AVNpub, BROine, DACglo, FESrub, LOLper |
| [PC13a] | Poznań, Cytadela park (7) | 16°55' E, 52°25' N | shaded ravine | ARRela, BROhor, BROine, ECHcru, FESaru, FESrub, LOLper, POAann, POApra, SETvir |
| [PC13b] | Poznań, Cytadela park (7) | 16°55' E, 52°25' N | scarp with south-western exposition | BROere, FESrub |
| [PC14] | Poznań, Cytadela park (7) | 16°55' E, 52°25' N | bushes near path | BROere, LOLper |
| [PC15] | Poznań, Cytadela park (7) | 16°55' E, 52°25' N | moist scrub | ALOpra |
| [PC16] | Poznań, Cytadela park (7) | 16°55' E, 52°25' N | shaded scarp | ARRela, BROhor, BROste, FESrub, POApra |
| [PC16a] | Poznań, Cytadela park (7) | 16°55' E, 52°25' N | shaded slope | FESaru |
| [PC18] | Poznań, Cytadela park (7) | 16°55' E, 52°25' N | moist scrub near a road | BROhor |
| [PKD] | Pieniny Mts.; Krościenko (27) | 20°24' E, 49°26' N | ravine | AGRcri, APEspi, ARRela, LOLper |
| [PLD] | Poznań, Lęgi Dębińskie forest (14) | 16°56' E, 52°23' N | mixed forest | AGRrep |
| [PLM01] | Poznań, Lasek Marceliński forest (4) | 16°52' E, 52°24' N | woodland | DACglo |
| [PLM02] | Poznań, Lasek Marceliński forest (4) | 16°52' E, 52°23' N | path in a mixed forest | AGOgig, ARRela, BROtec, DACglo |
| [PLM1] | Poznań, Lasek Marceliński forest (4) | 16°52' E, 52°23' N | scarp near allotment gardens | AGRrep, ARRela, AVNpra, BROhor, BROine, CALepi, FESaru, FESrub |
| [PLM2] | Poznań, Lasek Marceliński forest (4) | 16°52' E, 52°23' N | not mowed meadow near a forest margin | AGRrep, APEspi, ARRela, CALepi, DACglo, FESrub, HOLlan, PHAaru, PHRaus, POAnem, POApra |
| [PLM2a] | Poznań, Lasek Marceliński forest (4) | 16°52' E, 52°23' N | not mowed moist meadow | AGOcap, ANTodo, DACglo, HOLlan, POApra |
| [PLM3] | Poznań, Lasek Marceliński forest (4) | 16°52' E, 52°23' N | mixed forest | DACglo, FESrub, LOLper, POAann, POApra |
| [PLM10] | Poznań, Lasek Marceliński forest (4) | 16°52' E, 52°23' N | forest margin | AGRrep, BROine, BROste, FESrub, LOLper, POAann |
| [PLM11] | Poznań, Lasek Marceliński forest (4) | 16°52' E, 52°23' N | dry meadow near a forest margin | ARRela, DACglo |
| [PLM12] | Poznań, Lasek Marceliński forest (4) | 16°52' E, 52°23' N | roadside near allotment gardens | BROine, DACglo, FESaru, FESrub, LOLper |
| [PLM17] | Poznań, Lasek Marceliński forest (4) | 16°52' E, 52°23' N | road near allotment gardens | ARRela, BROhor, BROine, DACglo, POApra |
| [PMI] | Poznań, Miczurina Street (4) | 16°51' E, 52°23' N | roadside | AGRrep, LOLper |
| [POP] | Poznań, Poetów District (3) | 16°51' E, 52°23' N | roadside | AGRrep, ARRela, DACglo, HORmur, LOLper, POAann, SETvir |
| [PWA] | Poznań, Warta river-side (26) | 16°56' E, 52°23' N | meadow | PHLpra |
| [PWH] | Pieniny Mts.; Homole Gorge (27) | 20°24' E, 49°26' N | ravine, calcareous rock | BROine, CALepi, DEScae, MELnut, SESvar |
| [SLG1] | Słona near Głogów (1) | 16°06' E, 51°36' N | ditch near a field under wheat cultivation | AGRrep, AVEsat, FESpra, HORvul |
| [SLN1] | Słońsk (45) | 14°40' E, 52°33' N | seasonally flooded area | GLYmax, PHAaru |
| [SW1] | Słupia Wielka near Środa Wlkp. (13) | 17°15' E, 52°10' N | scarp near a railway track | FESrub |
| [SWC] | Słupia Wielka, Research Center for Cultivar Testing (COBORU) (13) | 17°15' E, 52°10' N | lawn near common juniper | FESrub |
| [SWC1] | Słupia Wielka, COBORU (13) | 17°15' E, 52°10' N | experimental plot | AGOcap, AGOgig, AGRrep, APEspi, ARRela, DACglo, DACpol, ECHcru, FESads, FESaru, FESovi, FESpra, FESrub, FETads, HORvul, LOLhyb, LOLmul, LOLper, PHAaru, PHLnod, PHLpra, POApal, POApra, SECcer, TRCaes, TRTrim |
| [SWC2] | Słupia Wielka, COBORU (13) | 17°15' E, 52°10' N | balk | AGRrep, ARRela |

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| [SWC3] | Słupia Wielka, COBORU (13) | 17°15' E, 52°10' N | path near experimental plots | AGRrep, APEspi, POAann, TRCaes |
| [SWC4] | Słupia Wielka, COBORU (13) | 17°15' E, 52°10' N | side of rearing pond | GLYmax |
| [SWINP] | Świnoujście (28) | 14°16' E, 53°53' N | port | PUCcap |
| [SWKO1] | Road from Koszuty to Słupia Wielka (15) | 17°16' E, 52°11' N | roadside ditch | AGRrep, ALOpra, ARRela, BROhor, BROine, BROtec, DACglo, FESaru, FESpra, FESrub, POApra, SECcer |
| [TRP1] | Tarnowo Podgórne near Poznań (23) | 16°40' E, 52°26' N | field under cultivation | HORvul, TRTrim |
| [WIER] | „Cisy Staropolskie" Leon Wyczółkowski Reserve in Wierzchlas, Bory Tucholskie (32) | 17°52' E, 53°39' N | shaded tuft of grass, near yew-tree | FESalt |
| [WIL1] | Wilkowo near Poznań | 16°40' E, 52°26' N | bushes near field | DEScae |
| [WPN1] | Wielkopolski National Park (16) | 16°47' E, 52°14' N | mixed forest | FESrub |
| [ZAD1] | Zatoń Dolna (Odra valley) (10) | 14°25' E, 53°11' N | field-path | AGOcap, AGRrep |
| [ZAD2] | Zatoń Dolna (Odra valley) (10) | 14°25' E, 53°11' N | field under wheat cultivation | AVEsat, TRCaes |
| [ZAD3] | Zatoń Dolna (Odra valley) (10) | 14°25' E, 53°11' N | forest margin | CALep, DACglo |
| [ZAD4] | Zatoń Dolna (Odra valley) (10) | 14°25' E, 53°11' N | idle land | AGRrep |
| [ZAD5] | Zatoń Dolna (Odra valley) (10) | 14°25' E, 53°11' N | dry meadow | BROine |
| [ZAD6] | Zatoń Dolna (Odra valley) (10) | 14°25' E, 53°11' N | margin of a field under oats cultivation | AVEsat |

by the date of sampling, number of specimens found (in parentheses), and initials of a collector. In the case that the sample was collected only by the author, the initials are omitted.

Explanations of initials: AS – author, ASu – Adrian SURMACKI, ASz – Anetta SZYWILEWSKA, JB – Jerzy BŁOSZYK, ML – Marlena LEMBICZ, TR – Tomasz RUTKOWSKI, WM – Wojciech MAGOWSKI.

### 4.2 HOST PLANTS

Totally, 71 grass species were collected, which are listed below. Grass species are followed by its abbreviations, used in the Table 1. Systematic nomenclature follows that of MIREK et al. (1995). Eriophyoids were found on 56 (79%) grass species. Number of mite species found on each of the grass species is placed in parenthesis after the abbreviation. These on which mites were not found are followed by minus in parenthesis.

*Agropyron caninum* (L.) P. BEAUV. - AGRcan (-)
*A. cristatum* (L.) GAERTN. – AGRcri (1)
*A. repens* (L.) P. BEAUV. – AGRrep (5)
*Agrostis canina* L. - AGOcan (-)
*A. capillaris* L. – AGOcap (3)
*A. gigantea* ROTH. – AGOgig (2)
*A. stolonifera* L. - AGOsto (-)
*Alopecurus aequalis* SOBOL. – ALOaeq (1)
*A. pratensis* L. – ALOpra (2)

*Ammophila arenaria* (L.) LINK – AMMare (1)
*Anthoxantum odoratum* L. - ANTodo (-)
*Apera spica-venti* (L.) P. BEAUV. - APEspi (1)
*Arrhenantherum elatius* (L.) P. BEAUV. EX J. PRESL & C. – ARRela (5)
*Avena sativa* L. - AVEsat (1)
*Avenula pratensis* (L.) DUMORT. – AVNpra (2)
*A. pubescens* (Huds.) DUMORT. – AVNpub (2)
*Brachypodium pinnatum* (L.) P. BEAUV. - BRApin (-)
*Bromus carinatus* HOOK. & ARN. - BROcar (1)
*B. erectus* HUDS. - BROere (3)
*B. hordaceus* L. – BROhor (3)
*B. inermis* LEYSS. - BROine (9)
*B. sterilis* L. – BROste (3)
*B. tectorum* L. – BROtec (1)
*Calamagrostis arundinacea* (L.) ROTH – CALaru (1)
*C. canescens* (WEBER) ROTH – CALcan (1)
*C. epigeios* (L.) ROTH – CALepi (7)
*Corynephorus canescens* (L.) P. BEAUV. – CORcan (2)
*Cynosurus cristatus* L. – CYNcri (1)
*Dactylis glomerata* L. – DACglo (6)
*D. polygama* HORV. - DACpol (-)
*Deschampsia caespitosa* (L.) P. BEAUV. – DEScae (1)
*D. flexuosa* (L.) TRIN. – DESfle (1)
*Echinochloa crus-galli* (L.) P. BEAUV. - ECHgal (-)
*Elymus arenarius* L. - ELYare (2)
*Festuca altissima* ALL. - FESalt (1)
*F. arundinacea* SCHREB. – FESaru (4)
*F. gigantea* (L.) VILL. - FESgig (-)
*F. ovina* L. - FESovi (1)
*F. rubra* L. – FESrub (9)
*F. pratensis* HUDS. – FESpra (3)
*Festulolium adscendens* (RETZ.) ASCH. & GRAEBN. – FETads (2)
*Glyceria fluitans* (L.) R. BR. - GLYflu (-)
*G. maxima* (HARTM.) HOLMB. - GLYmax (1)
*Holcus lanatus* L. - HOLlan (4)
*H. mollis* L.- HOLmol (1)
*Hordeum murinum* L. - HORmur (1)
*H. vulgare* L. - HORvul (1)
*Lolium hybridum* HAUSSKN. – LOLhyb (1)
*L. multiflorum* LAM. - LOLmul (-)
*L. perenne* L. - LOLper (4)
*Melica nutans* L. – MELnut (1)
*M. uniflora* RETZ. - MELuni (1)

*Nardus stricta* L. - NARstr (1)
*Phalaris arundinacea* L. – PHAaru (2)
*Phleum nodosum* (L.) TRABUT – PHLnod (1)
*P. pratense* L. - PHLpra (2)
*Phragmites australis* (CAV.) TRIN. EX STEUD. - PHRaus (-)
*Poa annua* L. - POAann (2)
*P. nemoralis* L. - POAnem (-)
*P. palustris* L. - POApal (-)
*P. pratensis* L. - POApra (3)
*Puccinellia capillaris* (LILJ.) JANSEN – PUCcap (2)
*P. distans* (JACQ.) PARL. - PUCdis (3)
*Secale cereale* L. - SECcer (-)
*Sesleria varia* (JACQ.) WETTST – SESvar (2)
*Setaria viridis* (L.) P. BEAUV. - SETvir (-)
*Stipa capillata* L. - STIcap (2)
*S. joannis* ČELAK. - STIjoa (1)
*Trisetum flavescens* (L.) P. BEAUV. – TRIfla (2
*Triticale rimpaui* WITTM. - TRTrim (1)
*Triticum aestivum* L. – TRCaes (2)

### 4.3. PARAMETERS OF INFESTATION

To determine the degree of mite infestation the following parameters were calculated: prevalence (*P*), intensity (*I*), density (*D*).

The prevalence was calculated as the proportion of the number of plants infested by mites to the number of all plants examined:

$$P = \frac{k}{n} 100\%$$

where:

$k$ – number of shoots of a given grass species infested by mites of a given species;

$n$ – number of all shoots of a given grass species under study.

The intensity was calculated as the mean number of mite specimens per infected shoot:

$$I = \frac{1}{k} \sum_{i=1}^{n} m_i$$

where:

$k$ – number of shoots of a given grass species infested by mites of a given species;

$m_i$ – number of mite specimens of a given species found on $i$ host shoot of a given species;

$n$ – number of all shoots a of given grass species under study.

This parameter was calculated on condition that $k > 1$.

The density was calculated as the mean number of mite specimens per each shoot:

$$D = \frac{1}{n}\sum_{i=1}^{n} m_i$$

where:

$m_i$ – number of mite specimens of a given species found on $i$ shoot of a given grass species;

$n$ – number of all shoots of a given grass species under study.

Confidence limits for prevalence were calculated directly from the binomial distribution. Confidence intervals for other parameters were computed using *bootstrap* method (EFRON & TIBSHIRANI 1993).

On the base of the number of hosts infested by a given mite species and the value of density ($D$) of infestation, the three classes of mite specificity were adopted, as follows:

1) specialists of the first degree (specialists I): mite species with very narrow specificity, which attain the density value higher than one specimens/shoot ($D>1$) on only one host species;

2) specialists of the second degree (specialists II): mite species with narrow specificity, which attain the density value higher than one specimens/shoot ($D>1$) on two or three hosts;

3) generalists: mite species with wide specificity, which attain the density value higher than one specimens/shoot ($D>1$) on more than three hosts.

Eriophyoid species which attain the value of density less than one specimens/shoot ($D<1$) on each of the infested hosts were removed from the analysis of the mite specificity.

On the basis of the value of density ($D$), three classes of hosts were adopted, as follows:

1) accidental hosts: grass species on which a given mite species attains the value of density less than one specimens/shoot ($D<1$), i.e. on which mites are encountered by accident;

2) accessory hosts: grass species on which a given mite species attains the value of density between one and six specimens/shoot ($1 \leq D \leq 6$), i.e. which may be suitable hosts for a given mite species, however, are infested moderately;

3) specific hosts: grass species on which a given mite species attains the value of density higher than six specimens/shoot ($D>6$), i.e. which are the most suitable plants for a given mite species.

For grouping the mite species according to their infestation similarity, the cluster analysis was used. Vectors of densities on different hosts were used to calculate Euclidean distance matrix between all possible combinations of mite species. Dendrograms were constructed using Ward's grouping method. Eriophyoid species which attain the value of density less than one specimens/shoot ($D<1$) on each of the infested host were removed from the analysis. The analysis was made using the STATISTICA software.

REMARK: Two species, *Aceria tenuis* (NALEPA) and *Abacarus compactus* SUKHAREVA, previously recorded in Poland, were not found during this survey. For this reason they were excluded from the ecological analysis and also their morphological descriptions were not made. However, they were included in the key to females, based on their original descriptions.

## 5. RESULTS

### 5.1. LIST OF SPECIES: DIAGNOSES, DESCRIPTIONS, REDESCRIPTIONS AND ECOLOGICAL NOTES

**Eriophyidae NALEPA, 1898**
**Eriophyinae NALEPA, 1898**
**Aceriini AMRINE et STASNY, 1994**
***Aceria* KEIFER, 1944**

***Aceria absentia* n. sp.**

DIAGNOSIS

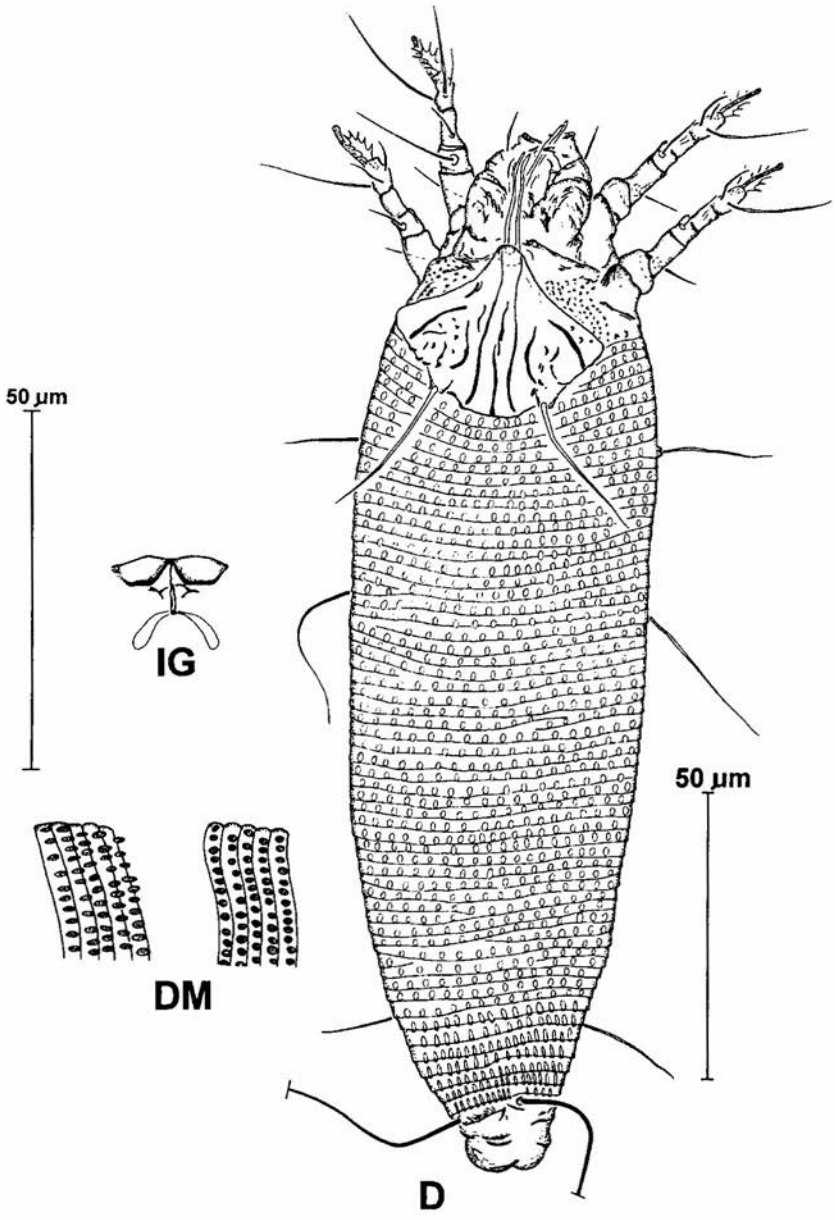
Female. Setae *h1* missing. Submedian lines forming a circle shaped figure on the posterior part of prodorsal shield. Empodial claw 4-rays. Dorsal and ventral microtubercles rounded.

DESCRIPTION

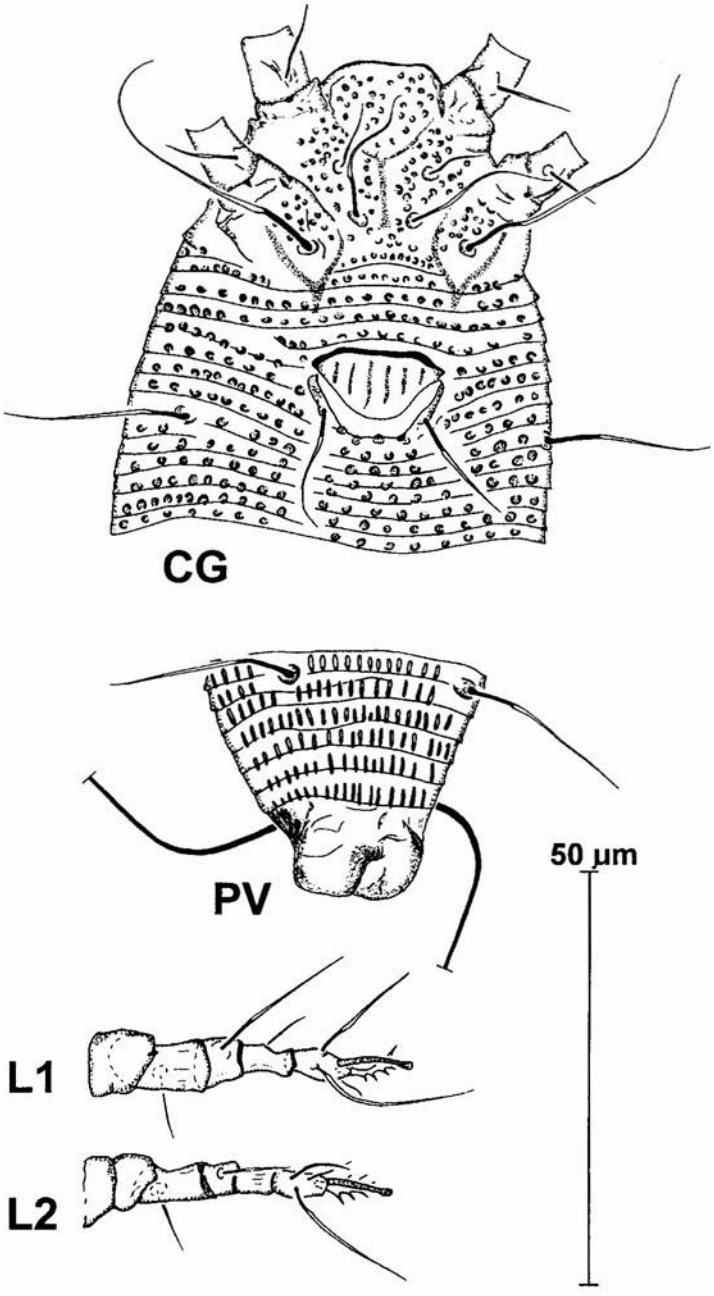
Female (n=7) (Figs 3-4): Body vermiform. Body length 184 (190-219); width 50 (50-57). Gnathosoma 26 (25-30) long; chelicerae 27 (26-27) long.

Prodorsal shield: 30 (31-35) long, 35 (34-35) wide. Anterior half triangular, posterior half semicircular. Little, roundred lobe over the base of chelicerae. Sculpture: median line on 3/4 rear half of shield; admedian lines from anterior lobe base diverging to rear margin; submedian lines forming a circle shaped figure on posterior part, dashes and microtubercles present between submedian I and II lines. Tubercles of setae *sc* on rear margin of shield, setae *sc* 28 (27-29) long, 19 (19-22) apart, projecting to rear.

Coxae: with a pattern of numerous long rounded microtubercles and holes. Sternal line slender.




3. *Aceria absentia* n. sp., female: D – dorsal aspect, DM – dorsal microtubercles, IG – internal genitalia




4. *Aceria absentia* n. sp., female: CG – coxigenital region, L1, L2 – legs I and II, PV – ventral telosome

Opisthosoma with 55 (52-55) dorsal annuli, 54 (54-55) ventral annuli, 5 (5) coxigenital annuli. Annuli with rounded or oval microtubercles, set along annuli margins, on telosomal annuli elongated.

Leg I: 31 (34-35); femur 9 (9), seta *bv* 10 (9-10); genu 5 (5), seta *l"* 19 (18-19); tibia 6 (6-7), seta *l'* 5 (5-7); tarsus 7 (7-8), setae: *ft"* 22 (19-22); *ft'* 15 (14-15), *u'* 5 (4-5); solenidion *ω* 10 (9-10); empodium 9 (8-9), simple, 4 (4)-rayed, symmetrical. Position of setae: *bv* 4 (3-4); *l"* 3 (3); *l'* 3 (3); *ft"* and *ft'* 2 (2-3); *u'* 5 (5).

Leg II: 29 (28-30); femur 8 (8-9), *bv* 10 (10-11); genu 4 (4-5), *l"* 10 (7-10); tibia 5 (5); tarsus 6 (6), *ft"* 23 (22-23), *ft'* 6 (6), *u'* 5 (5); solenidion *ω* 10 (10); empodium 8 (8), 4 (4)-rayed, symmetrical. Position of setae: *bv* 4 (4); *l"* 2 (2); *ft"* and *ft'* 2 (2); *u'* 4 (4).

Genital parts 11 (11-12) long, 16 (16-17) wide, genital coverflap with 6 (6-7) longitudinal ribs.

Length of setae: pedipalpal: *d* 6 (6); *v* 2 (2); *ep* 6 (6); coxigenital: *1b* 11 (9-11); *1a* 24 (22-23); *2a* 48 (48); opisthosomal: *c2* 21 (20-21); *d* 40 (40-50); *e* 10 (10); *f* 23 (22-23); *3a* 12 (12-14).

Distance between tubercles bearing setae: coxigenital: *1b* 10 (10-12); *1a* 7 (7-9); *2a* 19 (19-22); *1b* and *1a* 6 (6-7); *1a* and *2a* 8 (8); opisthosomal: *c2* 45 (45-51); *d* 30 (30-36); *e* 17 (17-18); *f* 21 (19-21); *3a* 12 (12); telosomal: *h2* 11 (11).

Number of ventral annuli bearing setae: *c2* 8 (7-8); *d* 18 (18-19); *e* 32 (32-34); *f* 49 (49), 6 (6) from rear.

Male, nymph and larva: not found

HOST PLANT

*Calamagrostis epigeios* (L.) ROTH. Relation to host plant: vagrant on the upper leaf surface, no visible damage.

TYPE MATERIAL

Female holotype, 6 female paratypes.

Type locality: Poznań, Cytadela park, not mowed meadow near the road [PC6], 28.11.1999, leg. AS.

ETYMOLOGY

The specific designation is derived from *absentia* (Latin) – lack, because of missing of the setae *h1*.

ECOLOGICAL NOTES

The species was found on one host species - *C. epigeios*. Values of its infestation ($k$=1; $n$=397) were extremely low: $P$=0.3% (95% *Cl:* 0.0%-1.4%), $D$=0.0 (*Cl:* 0.0 0.1) specimens per shoot. These suggest that *C. epigeios* may be an accidental host for *A. absentia*.

## *Aceria aculiformia* Sukhareva, 1986

Description

Female (n=13) (Figs 5-6): Body vermiform. Body length 174-288; width 46-59. Gnathosoma 22-27 long; chelicerae 19-24 long.

Prodorsal shield: 34-41 long, 34-38 wide. Anterior half triangular, posterior half semicircular. Little, rounded lobe reaching the half of the base of chelicerae. Sculpture: median line on less than 1/2 rear half of shield; admedian lines from anterior lobe base diverging to rear margin; submedian I lines parallel to admedian lines, not reach both anterior and posterior margin; submedian II lines on 1/2 rear half of shield, parallel to lateral margin; dashes present on rear half of shield. Tubercles of setae *sc* on rear margin of shield, setae *sc* 43-57 long, 22-28 apart, projecting to rear. Small, semirounded microtubercles present on surface near shield.

Coxae: with a pattern of numerous lines and dashes; coxae I with longitudinal lines and conical and subrounded microtubercles; coxae II with longitudinal and perpendicular lines with microtubercles. Sternal line anteriorly splited.

Opisthosoma with 67-75 dorsal annuli, 65-71 ventral annuli, 5-8 coxigenital annuli. Annuli with conical microtubercles: dorsal set along annuli margins, on telosomal annuli minute; ventral slightly ahead of annuli margins, on telosomal annuli elongated.

Leg I: 29-44; femur 8-9, seta *bv* 9-11; genu 5-6, seta *l"* 20-24; tibia 6-7, seta *l'* 7-10; tarsus 7-8, setae: *ft"* 21-27; *ft'* 16-21, *u'* 5-6; solenidion *ω* 8-10; empodium 9-11, simple, 7-8-rayed, symmetrical. Position of setae: *bv* 4; *l"* 2-3; *l'* 3; *ft"* and *ft'* 2-3; *u'* 4-6.

Leg II: 29-35; femur 9-10, *bv* 10-13; genu 4-5, *l"* 10-12; tibia 5-6; tarsus 7-8, *ft"* 23-26, *ft'* 8†11, *u'* 5-7; solenidion *ω* 9-10; empodium 10-11, 7-8-rayed, symmetrical. Position of setae: *bv* 4; *l"* 2-3; *ft"* and *ft'* 2-3; *u'* 4-5.

Genital parts 14-17 long, 18-22 wide, genital coverflap with 10-14 longitudinal ribs.

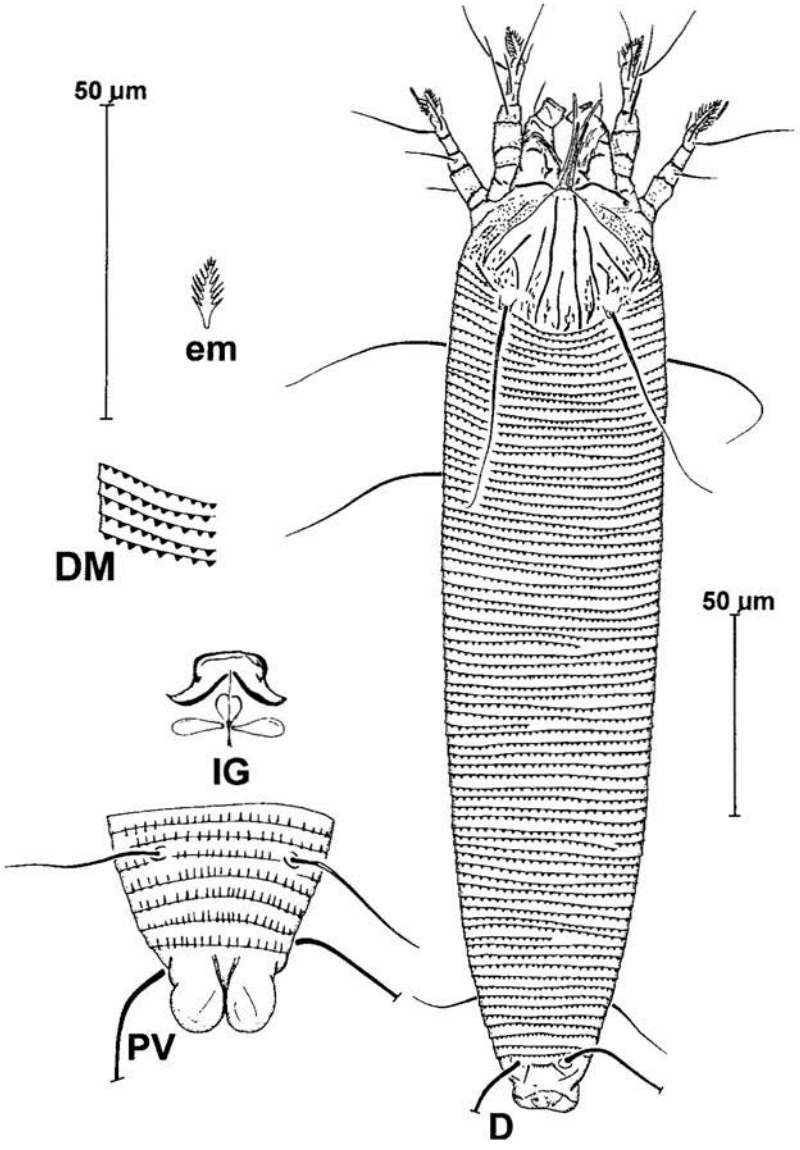
Length of setae: pedipalpal: *d* 8-10; *v* 2; *ep* 3-4; coxal: *1b* 8-10; *1a* 17-23; *2a* 42-49; opisthosomal: *c2* 38-54; *d* 40-57; *e* 32-52; *f* 23-30; *h1* 4-6; *h2* 78-89; *3a* 19-26.

Distance between tubercles bearing setae: coxal: *1b* 10-12; *1a* 8-10; *2a* 20-26; *1b* and *1a* 8-9; *1a* and *2a* 7-8; opisthosomal: *c2* 37-52; *d* 25-36; *e* 16-22; *f* 19-27; *3a* 13-17; telosomal: *h1* 6-9; *h2* 10-12; *h1* and *h2* 2-3.

Number of ventral annuli bearing setae: *c2* 8-10; *d* 21-24; *e* 36-43; *f* 61-67, 5 from rear.

Male (n=9): Body vermiform. Body length 180-219; width 44-48. Gnathosoma 21-25 long; chelicerae 20-22 long.

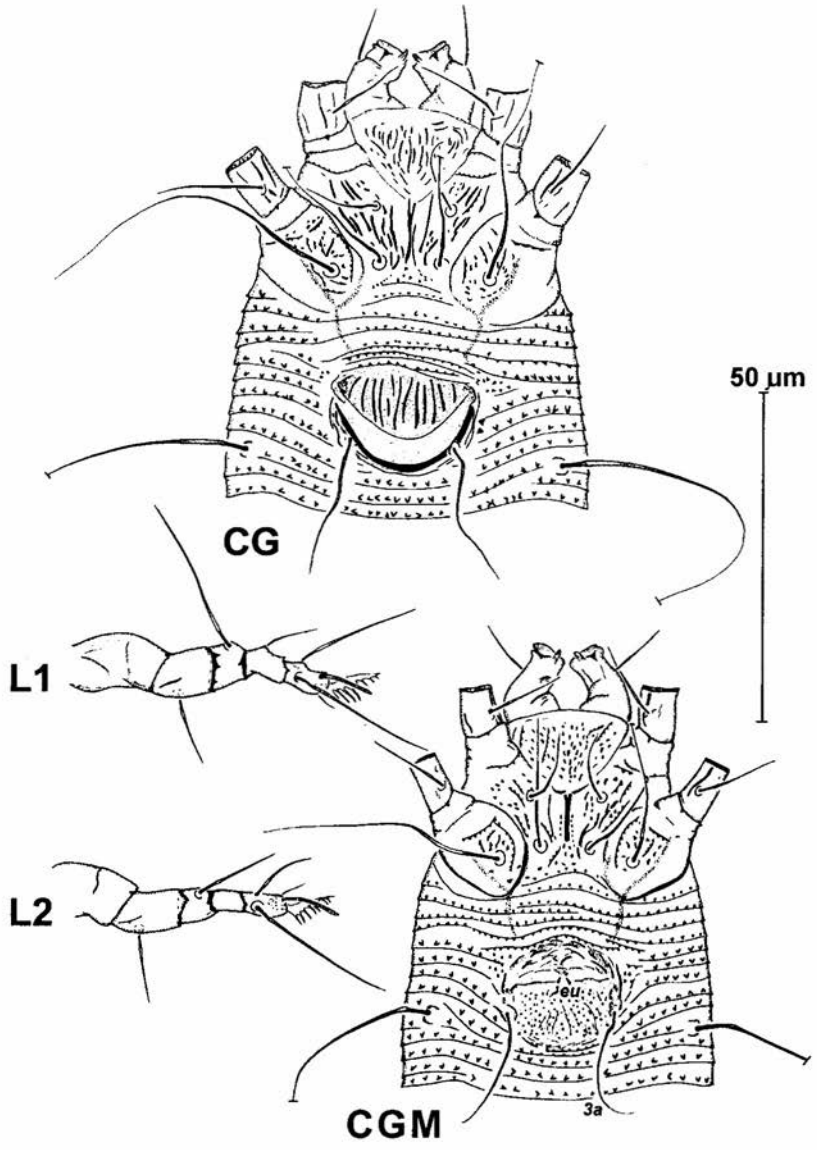
Prodorsal shield: 32-35 long, 32-38 wide. Shape and sculpture similar to that of female. Tubercles of setae *sc* on rear margin of shield, setae *sc* 33-43 long, 23-26 apart, projecting to rear.




5. *Aceria aculiformia* SUKHAREVA, female: D – dorsal aspect, DM – dorsal microtubercles, IG – internal genitalia, PV – ventral telosome, em – empodium

Coxae: with a pattern of numerous lines and conical and subrounded microtubercles. Sternal line slightly splited anteriorly (Fig. 6).

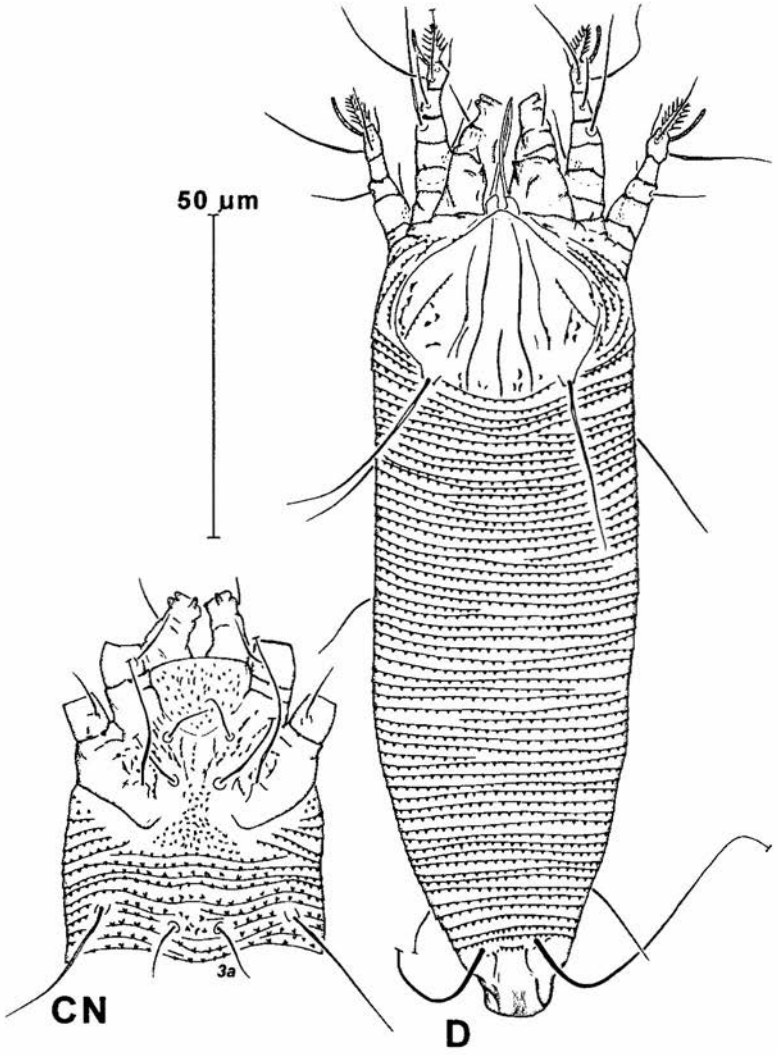
Opisthosoma with 61-66 dorsal annuli, 58-67 ventral annuli, 5-6 coxigenital annuli. Annuli with microtubercles: dorsal similar to that of female; ventral conical, pointed, ahead of annuli margins, on telosomal annuli elongated.




6. *Aceria aculiformia* SUKHAREVA: CG – coxigenital region of female, L1, L2 – legs I and II of female, CGM – coxigenital region of male

Leg I: 27-30; femur 7-8, seta *bv* 7-10; genu 4-5, seta *l"* 20-23; tibia 5-7, seta *l'* 7-9; tarsus 6 7, setae: *ft"* 21-24; *ft'* 14-19, *u'* 5-6; solenidion *ω* 8-9; empodium 8-10, simple, 6-7–rayed, symmetrical. Position of setae: *bv* 3-4; *l"* 2-3; *l'* 2-3; *ft"* and *ft'* 2-3; *u'* 4-5.

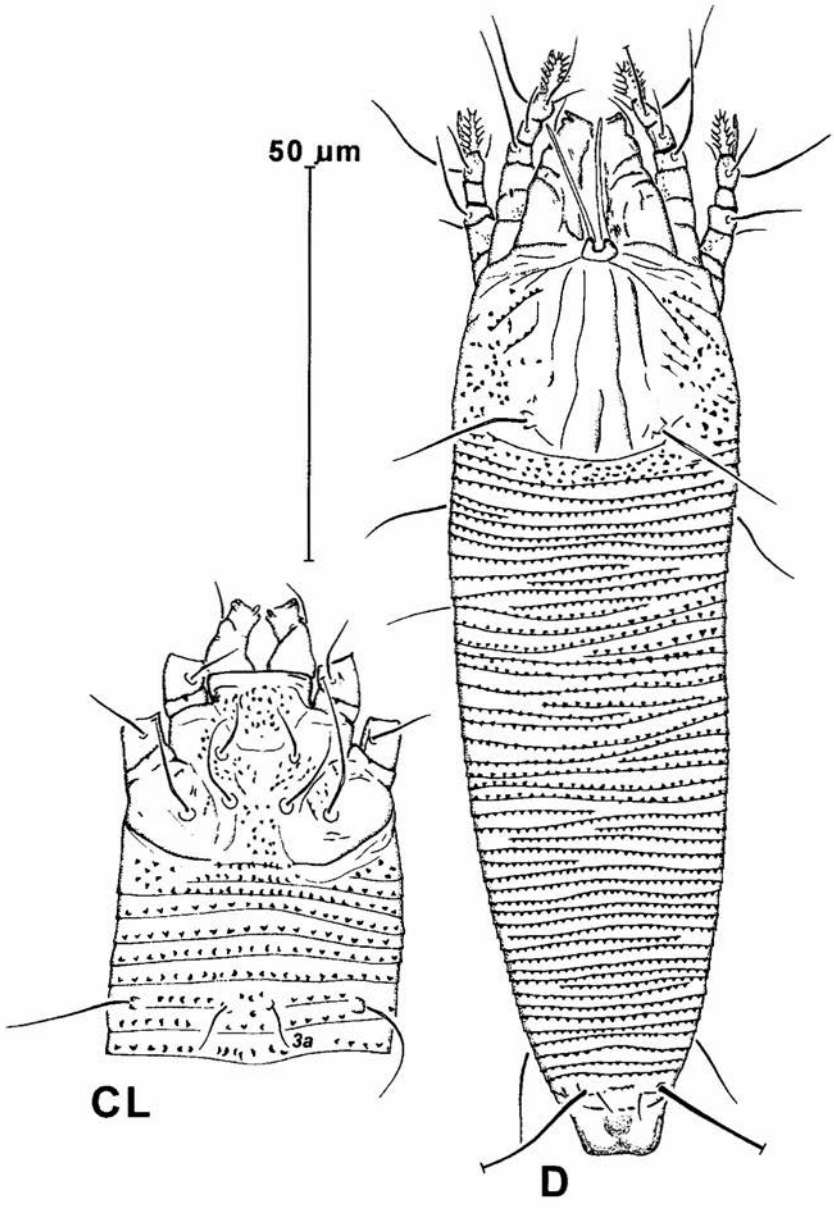
Leg II: 26-30; femur 8-9, *bv* 10-11; genu 4, *l"* 10-11; tibia 4-5; tarsus 6-7, *ft"* 21-27, *ft'* 7 10, *u'* 4-6; solenidion *ω* 9-10; empodium 9-10, 6-7-rayed, symmetrical. Position of setae: *bv* 3-4; *l"* 2; *ft"* and *ft'* 2; *u'* 3-4.




7. *Aceria aculiformia* SUKHAREVA, nymph: CN – coxisternum and *3a* and *c2* setae, D – dorsal aspect

Genital parts 15-18 long, 17-19 wide, surface below the eugenital setae with numerous, minute, conical microtubercles (Fig. 6).

Length of setae: pedipalpal: *d* 7-9; *v* 2; *ep* 3; coxal: *1b* 7-11; *1a* 17-23; *2a* 36-43; opisthosomal: *c2* 33-40; *d* 40-45; *e* 28-33; *f* 20-25; *3a* 16-21.




8. *Aceria aculiformia* SUKHAREVA, larva: CL – coxisternum and *3a* and *c2* setae, D – dorsal aspect

Distance between tubercles bearing setae: coxal: *1b* 10-11; *1a* 8-9; *2a* 19-22; *1b* and *1a* 8-9; *1a* and *2a* 6-7; opisthosomal: *c2* 39-43; *d* 26-29; *e* 15-17; *f* 18-23; *3a* 15-17; telosomal: *h1* 6-7; *h2* 9-10; *h1* and *h2* 2.

Number of ventral annuli bearing setae: *c2* 8-10; *d* 17-21; *e* 32-37; *f* 54-63, 5 from rear.

Nymph (n=6) (Fig. 7): Body vermiform. Body length 143-204; width 40-46. Gnathosoma 20-23 long; chelicerae 20 long.

Prodorsal shield: 30-33 long, 31-35 wide. Triangularly-oval, with little roundred lobe reaching 1/3 of cheliceral base. Sculpture: similar to that of female. Tubercles of setae *sc* on rear margin of shield, setae *sc* 29-34 long, 22-24 apart, projecting to rear.

Coxae: conical and subrounded microtubercles forming lines. Sternal line absent.

Opisthosoma with 54-66 dorsal annuli, 45-59 ventral annuli, 5-11 coxigenital annuli. Annuli with microtubercles: dorsal similar to that of female; ventral conical, pointed, set on or slightly ahead of annuli margins.

Leg I: 23-28; femur 7-8, seta *bv* 7-10; genu 4-5, seta *l"* 16-21; tibia 4-5, seta *l'* 6-7; tarsus 5-6, setae: *ft"* 17-21; *ft'* 13-15, *u'* 4-5; solenidion $\omega$ 6-7; empodium 7-8, simple, 6–rayed, symmetrical. Position of setae: *bv* 3-4; *l"* 2-3; *l'* 2; *ft"* and *ft'* 2; *u'* 3-4.

Leg II: 22-25; femur 7, *bv* 8-10; genu 3, *l"* 9-10; tibia 3-4; tarsus 5-6, *ft"* 17-21, *ft'* 7-9, *u'* 4 5; solenidion $\omega$ 7-8; empodium 7-8, 6-rayed, symmetrical. Position of setae: *bv* 3-4; *l"* 2; *ft"* and *ft'* 2; *u'* 3.

Length of setae: pedipalpal: *d* 7-8; *v* 2; *ep* 3; coxal: *1b* 6-7; *2a* 42; opisthosomal: *c2* 23-38; *d* 26-31; *e* 18-21; *f* 15-19; *3a* 9-10.

Distance between tubercles bearing setae: coxal: *1b* 10; *1a* 7-9; *2a* 17-20; *1b* and *1a* 7-8; *1a* and *2a* 6; opisthosomal: *c2* 29-39; *d* 20-27; *e* 12-17; *f* 17-21; *3a* 7-10; telosomal: *h1* 5-7; *h2* 9-10; *h1* and *h2* 2.

Number of ventral annuli bearing setae: *c2* 6-9; *d* 15-21; *e* 25-34; *f* 41-55, 5 from rear.

Larva (n=2) (Fig. 8): Body vermiform. Body length 130; width 31-35. Gnathosoma 18-19 long; chelicerae 17-19 long.

Prodorsal shield: 27 long, 26-27 wide, oval, with indistinct lateral margin, without anterior lobe. Sculpture: median and admedian lines similar to that of female; submedian I lines on the posterior half of shield, parallel to admedian; submedian lines II absent. Tubercles of setae *sc* ahead from posterior margin of shield, setae *sc* 12-17 long, 13-16 apart. Conical microtubercles present on surface near shield

Coxae: subrounded microtubercles forming lines. Sternal line absent.

Opisthosoma with 50-52 dorsal annuli, 35-36 ventral annuli, 6-7 coxigenital annuli. Annuli with microtubercles: dorsal conical, set along annuli margins, on

telosomal annuli subrounded; ventral subrounded or conical, slightly ahead of annuli margins, on telosomal annuli elongated.

Leg I: 21; femur 5-6, seta *bv* 8; genu 3-4, seta *l"* 16-18; tibia 4, seta *l'* 5-6; tarsus 5, setae: *ft"* 15-18; *ft'* 12-14, *u'* 3-4; solenidion *ω* 6-7; empodium 7, simple, 5-6–rayed, symmetrical. Position of setae: *bv* 3; *l"* 2; *l'* 2; *ft"* and *ft'* 1; *u'* 3.

Leg II: 17-21; femur 5-6, *bv* 7-8; genu 3, *l"* 6-9; tibia 3; tarsus 4-5, *ft"* 15-16, *ft'* 5-7, *u'* 3-4; solenidion *ω* 6; empodium 6-7, 5-6-rayed, symmetrical. Position of setae: *bv* 2-3; *l"* 2; *ft"* and *ft'* 2; *u'* 2.

Length of setae: pedipalpal: *d* 7; *v* 2; *ep* 3; coxal: *1b* 10; opisthosomal: *c2* 14-18; *d* 19-22; *e* 10-12; *f* 13-14; *h1* 3; *h2* 47; *3a* 5-7.

Distance between tubercles bearing setae: coxal: *1b* 9; *1a* 8; *2a* 17; *1b* and *1a* 5-6; *1a* and *2a* 5; opisthosomal: *c2* 27-28; *d* 16-18; *e* 11; *f* 14; *3a* 6; telosomal: *h1* 5; *h2* 9-10; *h1* and *h2* 2.

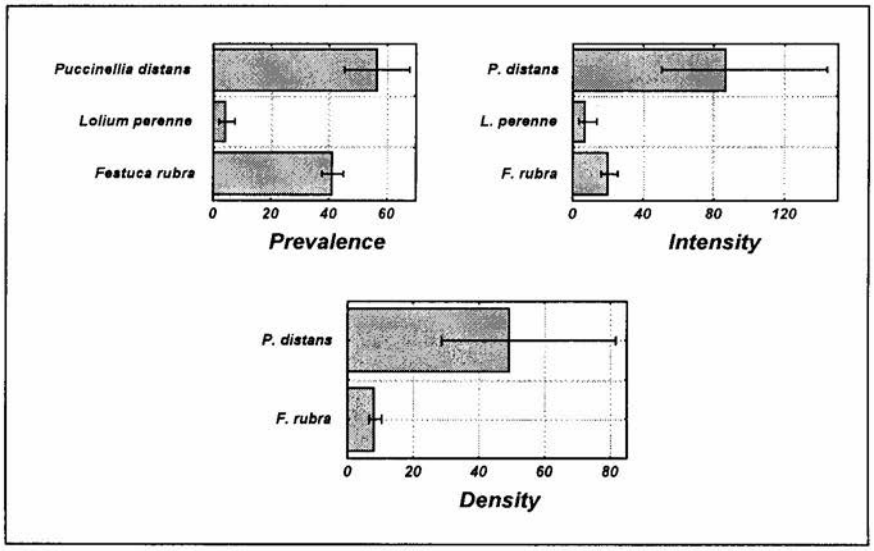
Number of ventral annuli bearing setae: *c2* 6-7; *d* 12-13; *e* 19-20; *f* 31-32, 5 from rear.

HOST PLANT

*Puccinellia distans* (JACQ.) PARL. Relation to host plant: vagrant on the upper leaf surface, mostly near the central vein and the top of leaf, frequently noticed in the leaf sheath; no visible damage.

MATERIAL

310 females, 209 males, 213 nymphs, 31 larvae from Pakość near Inowrocław, grazed meadow near a pond [IN1], 16.05.2000, leg. ML.




9. Prevalence, intensity and density of infestation of *Aceria aculiformia* on grass species

REMARKS

*A. aculiformia* is new for the Polish fauna.

Other records: *P. distans*: [IN2] - 16.05.2000, (40 specimens found); 29.05.2000, (120); [INM] - 16.05.2000, (2), leg. ML; [INJ] - 16.05.2000, (43), leg. ML; [IND] - 16.05.2000, (62), leg. ML; [INJA1] - 16.05.2000, (2), leg. ML; [INJA2] - 16.05.2000, (524), leg. ML; [INR] - 16.05.2000, (1090), leg. ML; [INS] - 16.05.2000, (69), leg. ML; [CIE1] - 16.05.2000, (5), leg. ML; [CIE2] - 16.05.2000, (543), leg. ML; *Festuca rubra*: [SW1] - 04.02.1999, (40); [SWC] - 18.02.1999, (34); 23.05.1999; (10); [OP1] - 12.06.1999, (8); [BWP] - 30.01.2000, (69); [PC5] - 25.02.1999, (53); [PC13] - 13.04.1999, (42); 23.05.1999, (89); 20.06.1999, (1035); 30.07.1999, (130); 31.08.1999, (111); 23.09.1999, (11); 28.11.1999, (43); 27.12.1999, (41); 29.01.2000, (61); 28.02.2000, (18); [PC13b] - 28.11.1999, (154); 28.02.2000, (58); [PC16] - 27.12.1999, (108); 29.01.2000, (164); [PLM2] - 30.04.1999, (133); 23.05.1999, (37); 20.06.1999, (66); 23.10.1999, (21); 27.12.1999, (37); [PLM1] - 30.04.1999, (38); [PLM12] - 28.11.1999, (942); [PLM3] - 23.05.1999, (122); 20.06.1999, (47); 30.07.1999, (217); 31.08.1999, (199); 23.09.1999, (340); 23.10.1999, (357); 28.11.1999, (77); 27.12.1999, (77); 22.01.2000, (185); 29.02.2000, (67); 29.03.2000, (17); *Lolium perenne*: [PBP1] - 19.08.1998, (32); [PLM3] - 20.06.1999, (15); [BRP1] - 15.07.1998, (250).

GENERAL DISTRIBUTION

Palearctic Region. The species so far was recorded in Russia in Khomustovskaya Steppe Reserve, Doneckaja Obl. on *Melica transsilvanica* SCHUR. (SUKHAREVA 1986).

ECOLOGICAL NOTES

Specialist II. *Puccinellia distans* and *Festuca rubra* are specific hosts; *Lolium perenne* is an accidental host (Table 2; Fig. 9).

Table 2

Parameters of infestation of *Aceria aculiformia*. Legend: *k* - number of shoots of a given grass species infested by mites of a given species, *n* - number of all shoots of a given grass species under study, *P* - prevalence [%], *I* - intensity [specimens/shoot], *D* - density [specimens/shoot], *LCI* - lower confidence limit, *UCI* - upper confidence limit, * - specific host, ** - accessory host, *** - accidental host.

| Host species | *n* | *k* | *P* | *LCI* | *UCI* | *I* | *LCI* | *UCI* | *D* | *LCI* | *UCI* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. *Festuca rubra** | 682 | 281 | 41.2 | 37.5 | 45.0 | 20.0 | 16.3 | 25.5 | 8.2 | 6.7 | 10.5 |
| 2. *Lolium perenne**** | 258 | 11 | 4.3 | 2.1 | 7.5 | 7.3 | 3.5 | 13.7 | 0.3 | 0.1 | 0.6 |
| 3. *Puccinellia distans** | 81 | 46 | 56.8 | 45.3 | 67.8 | 86.5 | 50.4 | 143.9 | 49.1 | 28.6 | 81.7 |

## *Aceria anthocoptes* (NALEPA, 1892)

*Phytoptus anthocoptes* NALEPA, 1892
*Eriophyes anthocoptes* (NALEPA, 1892)
*Aceria leontodonis* (LINDROTH, 1904) (PETANOVIĆ et al. 1997)

DESCRIPTION

Female (n=4) (Figs 10-11): Body vermiform. Body length 184-259; width 60-61. Gnathosoma 26-29 long; chelicerae 22-26 long.

Prodorsal shield: 34 long, 36-38 wide. Anterior half triangular, posterior half semicircular. Little lobe over the half of the base of chelicerae. Sculpture: median line complete; admedian lines from anterior lobe base slightly diverging to rear margin; submedian I lines anteriorly parallel to admedian, make a right angle in 1/3 of its length; submedian II lines short; short dashes present on rear half of shield. Tubercles of setae *sc* on rear margin of shield, setae *sc* 67 long, 27-28 apart, projecting to rear. Short dashes present on surface near shield.

Coxae: with a pattern of spots. Sternal line indistinct.

Opisthosoma with 56-62 dorsal annuli, 65-66 ventral annuli, 6-7 coxigenital annuli. Annuli with microtubercles: dorsal rounded, set along annuli margins, on telosomal annuli minute, subrounded or pointed; ventral conical, slightly pointed and ahead of annuli margins, on telosomal annuli elongated.

Leg I: 36-40; femur 11, seta *bv* 12; genu 6-7, seta *l"* 29-30; tibia 8-9, seta *l'* 10; tarsus 8-9 setae: *ft"* 29-33; *ft'* 16-19, *u'* 7; solenidion *ω* 9-10; empodium 8-9, simple, 5-rayed, symmetrical. Position of setae: *bv* 5; *l"* 3; *l'* 2; *ft"* and *ft'* 2; *u'* 5-6.

Leg II: 32-39; femur 10-11, *bv* 11-13; genu 5-6, *l"* 13; tibia 7; tarsus 8-9, *ft"* 30-32, *ft'* 10, *u'* 5-6; solenidion *ω* 9-10; empodium 9-11, 5-rayed, symmetrical. Position of setae: *bv* 4-5; *l"* 3; *ft"* and *ft'* 2; *u'* 5-6.

Genital parts 10-12 long, 21-23 wide, genital coverflap with 10-12 longitudinal ribs.

Length of setae: pedipalpal: *d* 8; coxal: *1b* 11-12; *1a* 26; *2a* 50-52; opisthosomal: *c2* 29; *d* 67 69; *e* 14-22; *f* 24-29; *h1* 7-9; *3a* 14-18.

Distance between tubercles bearing setae: coxal: *1b* 11-12; *1a* 9-10; *2a* 25; *1b* and *1a* 9; *1a* and *2a* 8-10; opisthosomal: *c2* 56-57; *d* 40-46; *e* 24-25; *f* 26-27; *3a* 18-19; telosomal: *h1* 10; *h2* 12-15; *h1* and *h2* 3.

Number of ventral annuli bearing setae: *c2* 10; *d* 22; *e* 35-36; *f* 60, 6 from rear.

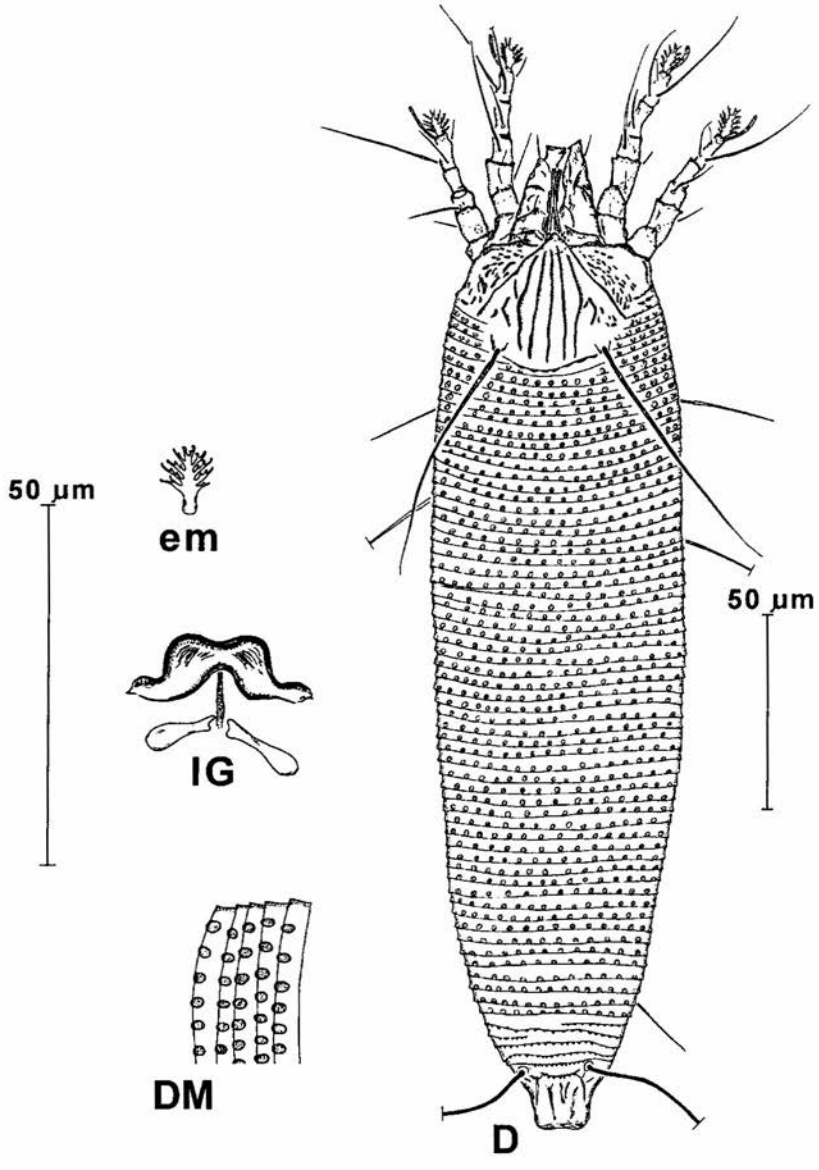
Male, nymph and larva not found.

HOST PLANT

*Lolium perenne* L. Relation to host plant: vagrant on the upper leaf surface; no visible damage.

MATERIAL

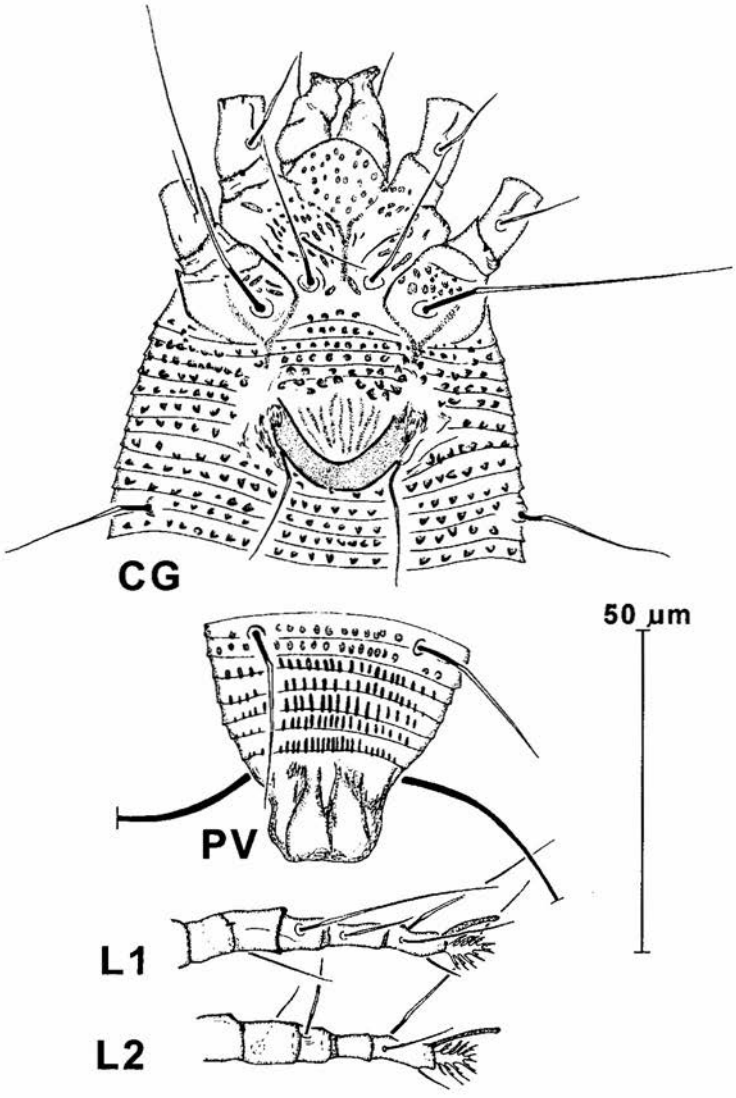
16 females from Kazimierz, path in mixed forest [KA1], 25.10.1999, leg. AS, and from Poznań, Lasek Marceliński forest, mixed forest [PLM3], 28.11.1999, leg. AS.




10. *Aceria anthocoptes* (NALEPA), female: D – dorsal aspect, DM – dorsal microtubercles, IG – internal genitalia, em – empodium

REMARKS

The type host plant for *A. anthocoptes* is Canada Thistle *Cirsium arvense* (L.) SCOP. (AMRINE & STASNY 1994). The species was redescribed by PETANOVIČ et al. (1997). The species is new for the Polish fauna.




11. *Aceria anthocoptes* (NALEPA), female: CG – coxigenital region, L1, L2 – legs I and II, PV – ventral telosome

ECOLOGICAL NOTES

The species was found on one host species – *L. perenne*. Values of its infestation ($n$=258; $k$=1) were extremely low: $P$=0.4% (*Cl:* 0.0%-2.1%) and $D$=0.0 (*Cl*: 0.0-0.1) specimens per shoot. This species is accidental on *L. perenne*, and on grasses generally.

GENERAL DISTRIBUTION

Palearctic Region (AMRINE & STASNY 1994).

## *Aceria calamagrostis* SUKHAREVA, 1977

DESCRIPTION

Female (n=7) (Fig. 12): Body vermiform. Body length 260-271; width 50-51. Gnathosoma 22 long; chelicerae 19 long.

Prodorsal shield: 33-34 long, 31 wide. Subtriangular, with little lobe over the base of chelicerae. Sculpture: median line on 3/4 rear half of shield; admedian lines from anterior lobe base slightly diverging to rear margin; submedian I lines parallel to admedian lines, over tubercles bearing *sc* setae diverging to lateral margins; submedian II lines parallel to submedian I; numerous dashes present on rear half of shield. Tubercles of setae *sc* on rear margin of shield, setae *sc* 38-40 long, 23-24 apart, projecting to rear.

Coxae: with a pattern of numerous dashes and few longer lines, all longitudinal. Sternal line present.

Opisthosoma with 99-102 dorsal annuli, 81-83 ventral annuli, 7 coxigenital annuli. Annuli with subrounded microtubercles: dorsal slightly ahead of annuli margins, on telosomal annuli minute; ventral set along annuli margins, on telosomal annuli elongated.

Leg I: 31-32; femur 11, seta *bv* 9; genu 5, seta *l"* 26-27; tibia 7, seta *l'* 7-8; tarsus 7, setae *ft"* 23-24; *ft'* 14-16, *u'* 5-6; solenidion $\omega$ 7; empodium 8, simple, 7-rayed, symmetrical. Position of setae: *bv* 5; *l"* 3; *l'* 3; *ft"* and *ft'* 2; *u'* 5.

Leg II: 32; femur 9, *bv* 13-14; genu 5, *l"* 10-11; tibia 5; tarsus 7, *ft"* 24, *ft'* 7; solenidion $\omega$ 8; empodium 7, 7-rayed, symmetrical. Position of setae: *bv* 3; *l"* 3; *ft"* and *ft'* 2; *u'* 5.

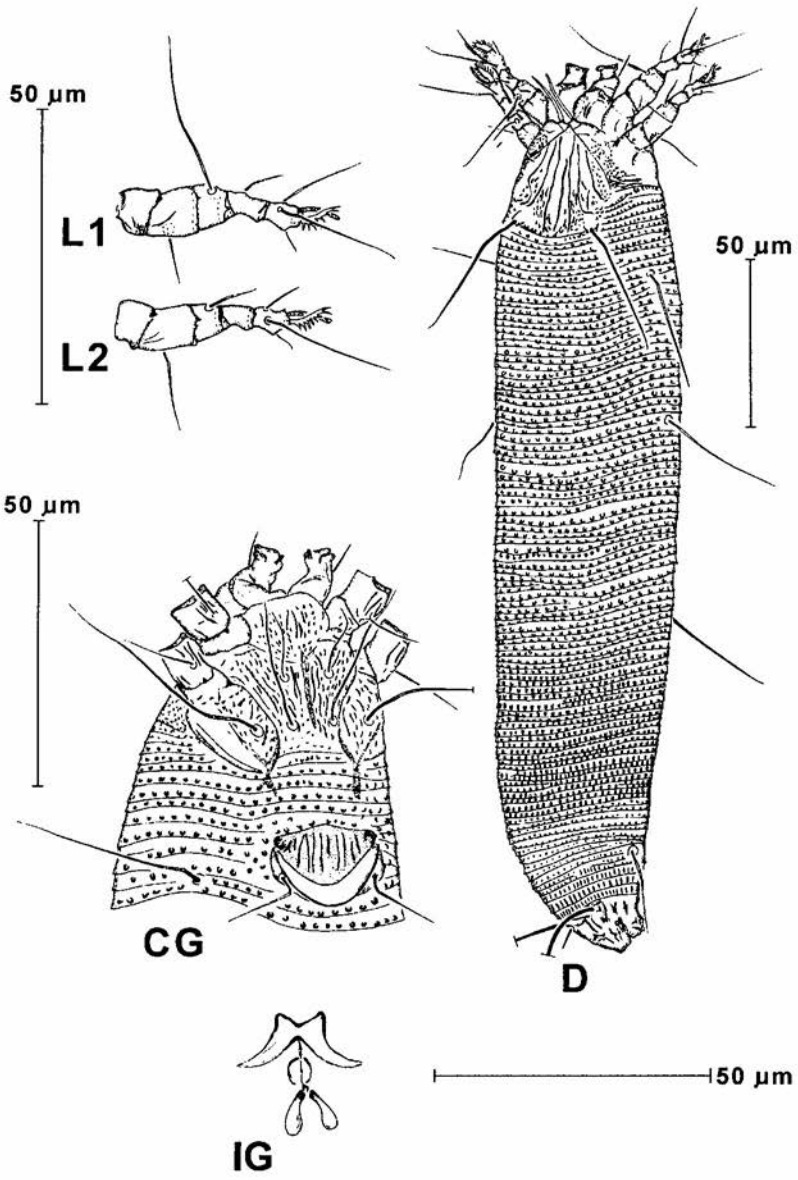
Genital parts 14-15 long, 18-19 wide, genital coverflap with 10 longitudinal ribs.

Length of setae: pedipalpal: *d* 8; *v* 2; coxal: *1b* 10; *1a* 23-24; *2a* 42-43; opisthosomal: *c2* 34; *d* 38-40; *e* 48; *f* 23-25; *h1* 6; *3a* 16.

Distance between tubercles bearing setae: coxal: *1b* 9; *1a* 7; *2a* 21; *1b* and *1a* 9; *1a* and *2a* 8; opisthosomal: *c2* 48; *d* 29; *e* 19; *f* 23; *3a* 17; telosomal: *h1* 8; *h2* 12; *h1* and *h2* 3.

Number of ventral annuli bearing setae: *c2* 10-11; *d* 26; *e* 45; *f* 76, 6 from rear.

Male, nymph, larva: not found.




12. *Aceria calamagrostis* SUKHAREVA, female: CG – coxigenital region, D – dorsal aspect, IG – internal genitalia, L1, L2 – legs I and II

HOST PLANT

*Festuca rubra* L. Relation to host plant: vagrant on the upper leaf surface; no visible damage.

MATERIAL

20 females from Poznań, Cytadela park, scarp with south exposition [PC13] 20.01.2000, leg. AS.

REMARKS

The type host plant for *A. calamagrostis* is *Calamagrostis arundinacea* L. It was also found on *Calamagrostis epigeios* L. (SUKHAREVA 1977). The species is new for the Polish fauna.

ECOLOGICAL NOTES

The species was found on one host species – *F. rubra*. Values of its infestation ($k$=2; $n$=682) were: $P$=0.3% (*Cl*: 0.0%-1.1%), $D$=0.0 (*Cl*: 0.0-0.0) specimens per stem. This suggest that *F. rubra* may be an accidental host for *A. calamagrostis*.

GENERAL DISTRIBUTION

Palearctic Region. The species so far was recorded in Russia (AMRINE & STASNY 1994).

### *Aceria erecti* n. sp.

DIAGNOSIS

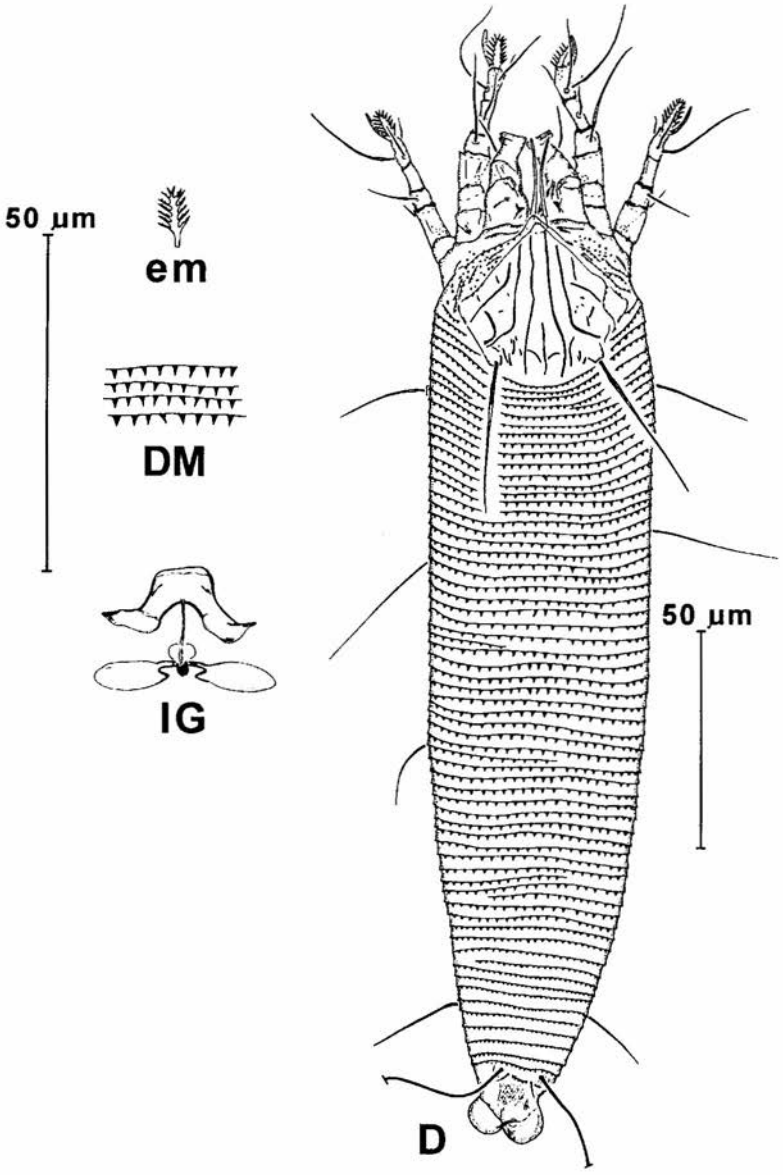
*Aceria erecti* is the most similar to *Aceria milli* XIN et DONG, 1982 (*Triticum aestivum* L., Poaceae, Chiny) by the shape of dorsal microtubercles, the sculpture of prodorsal shield, number of empodial rays (7), and the length of *sc* setae (46).

*A. erecti* can be distinguished from *A. milli* by the presence of anterior lobe over the cheliceral base and the proportion of the prodorsal shield. In *A. milli* there is lack of the anterior lobe, the prodorsal shield is longer (41) than wide (36). In *A. erecti* there is a little anterior lobe over the cheliceral base, the prodorsal shield is wider (42) than long (38). Those two species differ also in the number of dorsal and ventral annuli (88 and 84 in *A. milli,* 61 and 58 in *A. erecti*) and the length of solenidion I and II (14 and 16 in *A. milli,* 9 and 10 in *A. erecti*).

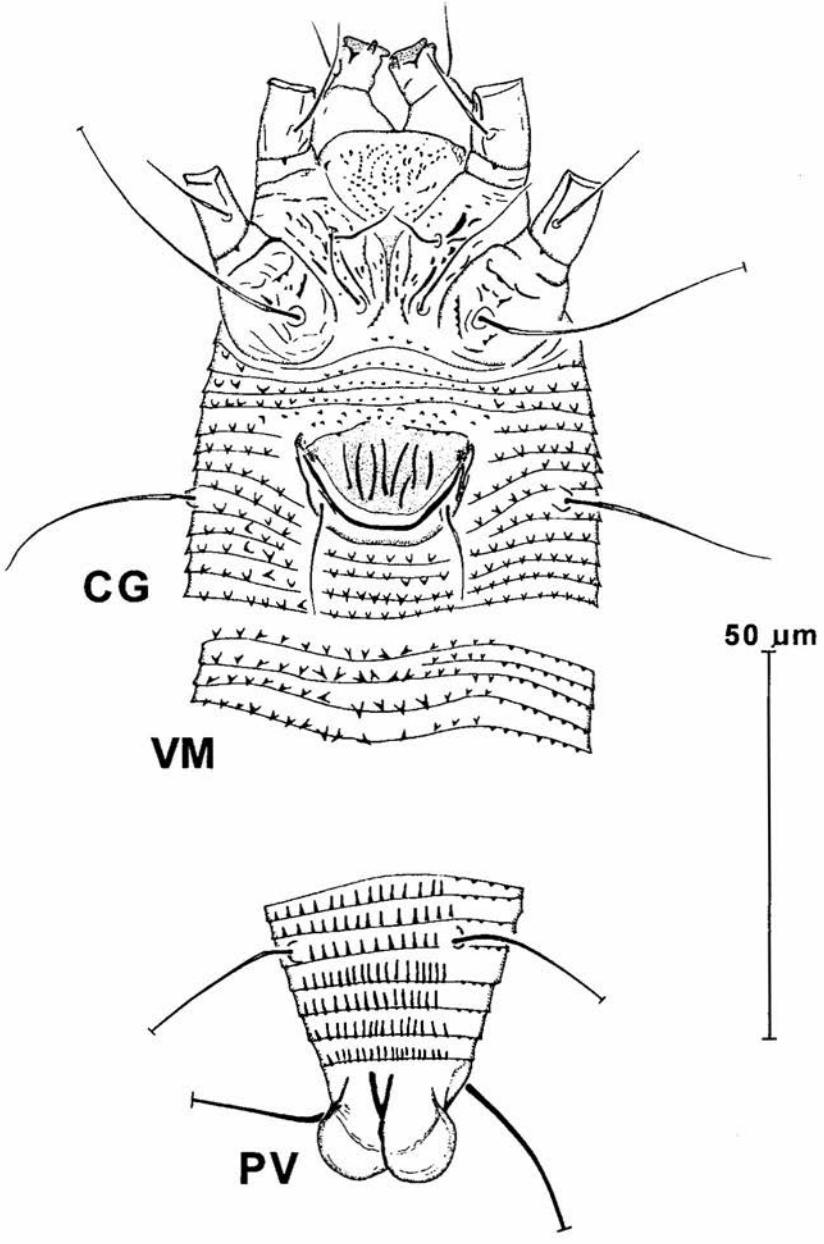
DESCRIPTION

Female (n=19) (Figs 13-15): Body vermiform. Body length 232 (184-262); width 55 (45-56). Gnathosoma 26 (23-28) long; chelicerae 22 (21-24) long.

Prodorsal shield: 38 (36-40) long, 42 (37-43) wide. Anterior half triangular, posterior half semicircular. Little lobe reaching half of the base of chelicerae. Sculpture: median line on rear half of shield; admedian lines entire, sinuous; I submedian lines subparallel to admedian lines, running lateral just in front of




13. *Aceria erecti* n. sp., female: D – dorsal aspect, DM – dorsal microtubercles, IG – internal genitalia, em – empodium




14. *Aceria erecti* n. sp., female: CG – coxigenital region, PV – ventral telosome, VM – ventral microtubercles

tubercles of *sc* setae, II submedian lines sinuous; arched, transversal lines between median and admedian, and submedian I and II; dashes on rear half of shield. Tubercles of setae *sc* on rear margin of shield, setae *sc* 46 (36-48) long, 26 (22-28) apart, projecting to rear. Dashes and conical microtubercles on surface near shield.

Coxae: with a pattern of numerous lines and dashes, some with conical microtubercles; infracapitulum with subrounded microtubercles. Sternal line slender, anteriorly split.

Opisthosoma with 61 (57-66) dorsal annuli, 58 (53-64) ventral annuli, 4 (4-5) coxigenital annuli. Annuli with conical, elongated and pointed microtubercles: dorsally set along annuli margins, on telosomal annuli minute and not pointed; ventrally slightly ahead of annuli margins, on telosomal annuli elongated.

Leg I: 40 (32-40); femur 10 (9-10), seta *bv* 11 (9-13); genu 6 (5-7), seta *l''* 26 (23-29); tibia 9 (7-9), seta *l'* 11 (8-11); tarsus 9 (8-9), setae: *ft''* 31 (24-30); *ft'* 22 (16-22), *u'* 6 (5-8); solenidion *ω* 9 (8-10); empodium 10 (9-11), simple, 7 (6-7)-rayed, symmetrical. Position of setae: *bv* 4 (4-5); *l''* 3 (3-4); *l'* 4 (3-4); *ft''* and *ft'* 3 (2-3); *u'* 6 (4-6).

Leg II: 36 (30-36); femur 10 (10-11), *bv* 12 (11-17); genu 5 (4-5), *l''* 12 (10-13); tibia 7 (7-8); tarsus 9 (7-9), *ft''* 27 (24-29), *ft'* 10 (7-11), *u'* 6 (5-7); solenidion *ω* 10 (8-10); empodium 11 (10-12), 7 (6-7)-rayed, symmetrical. Position of setae: *bv* 4 (4-5); *l''* 3 (2-4); *ft''* and *ft'* 3 (2-3); *u'* 5 (4-6).

Genital parts 17 (14-19) long, 23 (21-23) wide, genital coverflap with 9 (7-11) longitudinal ribs.

Length of setae: pedipalpal: *d* 10 (9-11); *v* 2 (2); *ep* (3-4); coxal: *1b* 10 (7-13); *1a* 19 (16-25); *2a* 40 (36-44); opisthosomal: *c2* 36 (25-33); *d* 45 (32-46); *e* 26 (23-33); *f* 26 (22-28); *h1* 5 (3-5); *h2* 68 (65-75); *3a* 17 (13-19).

Distance between tubercles bearing setae: coxal: *1b* 13 (10-13); *1a* 9 (5-10); *2a* 25 (20-26); *1b* and *1a* 10 (9-10); *1a* and *2a* 9 (7-9); opisthosomal: *c2* 48 (40-52); *d* 29 (28-34); *e* 15 (14-17); *f* 21 (18-21); *3a* 15 (15-17); telosomal: *h1* 6 (6-7); *h2* 10 (10); *h1* and *h2* 2 (2-3).

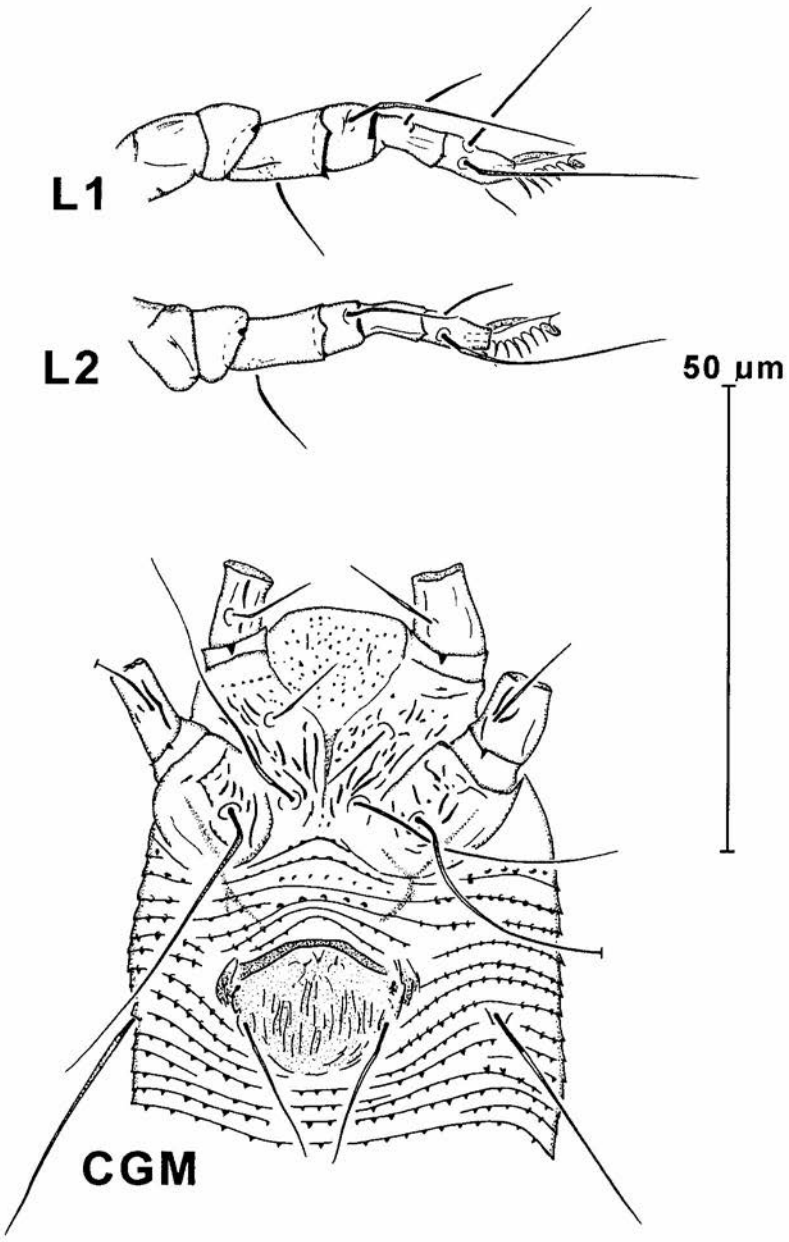
Number of ventral annuli bearing setae: *c2* 8 (6-9); *d* 20 (17-22); *e* 33 (30-37); *f* 54 (49-60), 5 (5) from rear.

Male (n=4): Body vermiform. Body length 167-202; width 45-48. Gnathosoma 20-23 long; chelicerae 20-22 long.

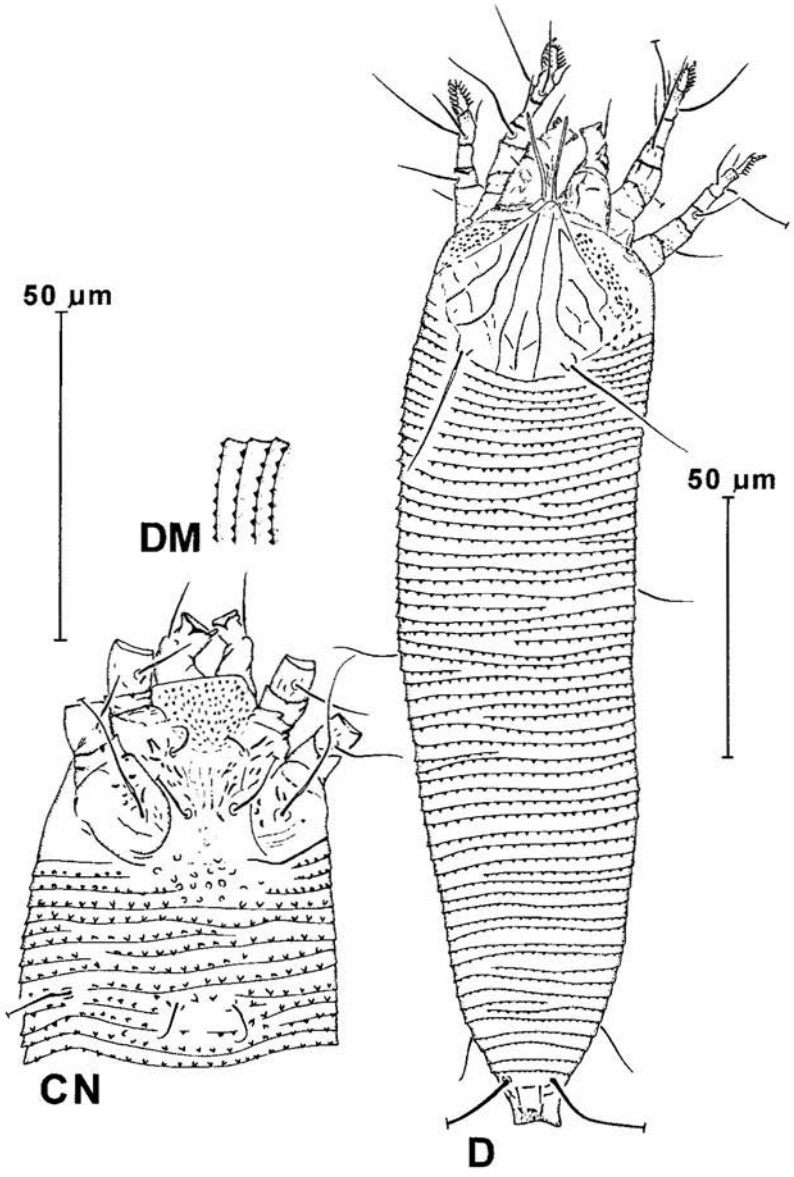
Prodorsal shield: 34-35 long, 38 wide. Shape and sculpture similar to that of female. Tubercles of setae *sc* on rear margin of shield, setae *sc* 26-29 long, 22-24 apart, projecting to rear.

Coxae: with a pattern similar to that of female (Fig. 15).

Opisthosoma with 49-55 dorsal annuli, 52-56 ventral annuli, 4 coxigenital annuli. Annuli with microtubercles: dorsal similar to that of female, more minute; ventral minute, conical, a little pointed, set along annuli margins.




15. *Aceria erecti* n. sp.: L1, L2 – legs I and II of female, CGM – coxigenital region of male




16. *Aceria erecti* n. sp., nymph: CN – coxisternum and *3a* and *c2* setae, D – dorsal aspect, DM – dorsal microtubercles

Leg I: 30-34; femur 9-10, seta *bv* 7-11; genu 5, seta *l''* 20-23; tibia 7, seta *l'* 8-10; tarsus 7-8, setae: *ft''* 22-24; *ft'* 16-18, *u'* 5-7; solenidion *ω* 8; empodium 9-10, simple, 6–rayed, symmetrical. Position of setae: *bv* 4; *l''* 3; *l'* 3; *ft''* and *ft'* 2-3; *u'* 4-5.

Leg II: 29-31; femur 9, *bv* 10-12; genu 4, *l''* 10-11; tibia 6-7; tarsus 7-8, *ft''* 19-24, *ft'* 7-9, *u'* 5-7; solenidion *ω* 8-9; empodium 9-10, 6-rayed, symmetrical. Position of setae: *bv* 4; *l''* 2-3; *ft''* and *ft'* 2-3; *u'* 4-5.

Genital parts 15-17 long, 19 wide, surface below the eugenital setae with longitudinal, slender lines (Fig. 15).

Length of setae: pedipalpal: *d* 8-10; *v* 2; *ep* 3; coxal: *1b* 10; *1a* 19; *2a* 31; opisthosomal: *c2* 17-29; *d* 29-33; *e* 16-24; *f* 17-21; *3a* 13-16; telosomal: *h1* 4.

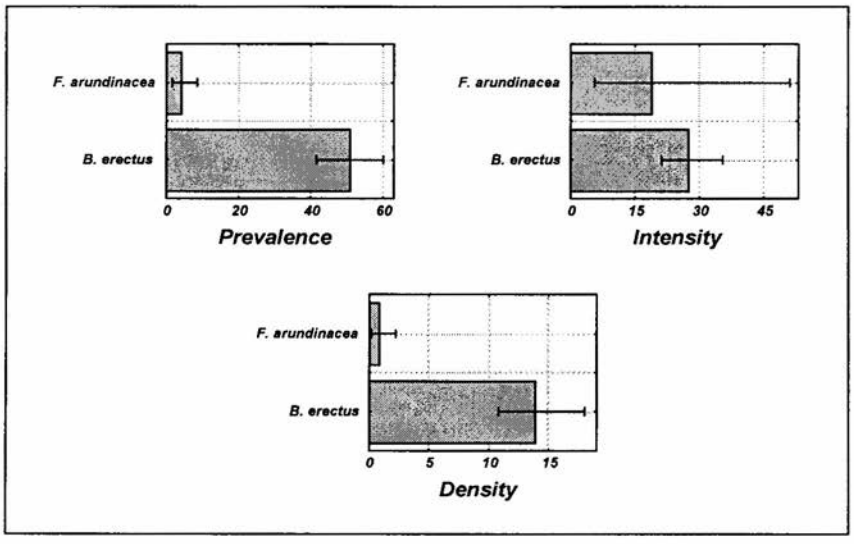
Distance between tubercles bearing setae: coxal: *1b* 10-12; *1a* 7-8; *2a* 20-22; *1b* and *1a* 8-9; *1a* and *2a* 7; opisthosomal: *c2* 38-42; *d* 25-26; *e* 13; *f* 17-19; *3a* 14-15; telosomal: *h1* 5-6; *h2* 9-10; *h1* and *h2* 2.

Number of ventral annuli bearing setae: *c2* 7-8; *d* 15-19; *e* 28-32; *f* 48-52, 5 from rear.

Nymph (n=6) (Fig. 16): Body vermiform. Body length 169-203; width 45-48. Gnathosoma 19-21 long; chelicerae 20-21 long.

Prodorsal shield: 33-36 long, 37-38 wide. Triangularly-oval, with little lobe reaching 1/2 of cheliceral base. Sculpture: similar to that of female. Tubercles of setae *sc* on rear margin of shield, setae *sc* 21-28 long, 18-21 apart, projecting to rear.

Coxae: short lines and subrounded microtubercles forming lines. Sternal line absent.




17. Prevalence, intensity and density of infestation of *Aceria erecti* on *Festuca arundinacea* and *Bromus erectus*

Opisthosoma with 53-58 dorsal annuli, 52-56 ventral annuli, 8-9 coxigenital annuli. Annuli with microtubercles: dorsal conical, a little pointed, set along annuli margin; ventral subrounded or conical, ahead of annuli margins.

Leg I: 29-30; femur 7-8, seta *bv* 8-10; genu 4-5, seta *l"* 16-24; tibia 5-6, seta *l'* 8-9; tarsus 6-7, setae: *ft"* 17-22; *ft'* 13-14, *u'* 4-6; solenidion *ω* 7-8; empodium 7-10, simple, 6–rayed, symmetrical. Position of setae: *bv* 3-4; *l"* 2-3; *l'* 2-3; *ft"* and *ft'* 2; *u'* 3-4.

Leg II: 26-28; femur 7-8, *bv* 9-12; genu 4, *l"* 8-10; tibia 4-5; tarsus 6-7, *ft"* 16-19, *ft'* 7-12, *u'* 4-5; solenidion *ω* 7; empodium 7-8, 6-rayed, symmetrical. Position of setae: *bv* 3-4; *l"* 2; *ft"* and *ft'* 2; *u'* 3-4.

Length of setae: pedipalpal: *d* 7-9; *v* 2; *ep* 2-3; coxal: *1b* 6-8; *1a* 17; *2a* 28; opisthosomal: *c2* 10-19; *d* 18-28; *e* 10-15; *f* 13-17; *3a* 7-10; telosomal: *h1* 3-5.

Distance between tubercles bearing setae: coxal: *1b* 10-12; *1a* 7-9; *2a* 21-22; *1b* and *1a* 9; *1a* and *2a* 7-8; opisthosomal: *c2* 38-40; *d* 24-27; *e* 13-15; *f* 17-19; *3a* 8-9; telosomal: *h1* 5; *h2* 9-10; *h1* and *h2* 2-3.

Number of ventral annuli bearing setae: *c2* 8-9; *d* 19; *e* 30-33; *f* 48-52, 5 from rear.

Larva not found

HOST PLANT

*Bromus erectus* HUDS. Relation to host plant: vagrant on the upper leaf surface, no visible damage.

TYPE MATERIAL

Female holotype, 36 female paratypes, 4 male paratypes, 6 nymph paratypes.

Type locality: Poznań, Cytadela park, scarp with south-western exposition [PC13b], 30.10.1999, leg. AS.

ETYMOLOGY

The specific designation is derived from the specific name of type host plant - *B. erectus*.

OTHER RECORDS

*B. erectus*: [PC13b] - 23.05.1999, (84); 31.08.1999, (265); 23.09.1999, (202); 28.11.1999,(169); 27.12.1999,(198); 29.01.2000,(60); 28.02.2000,(47); 29.03.2000, (131); *Festuca arundinacea*: [PC16a] - 30.10.1999, (132).

Table 3

Parameters of infestation of *Aceria erecti*. For legend see Table 2.

| Host species | *n* | *k* | *P* | *LCI* | *UCI* | *I* | *LCI* | *UCI* | *D* | *LCI* | *UCI* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. *Bromus erectus** | 120 | 61 | 50.8 | 41.6 | 60.1 | 27.4 | 21.2 | 35.5 | 13.9 | 10.8 | 18.0 |
| 2. *Festuca arundinacea*** | 165 | 7 | 4.2 | 1.7 | 8.6 | 18.9 | 5.6 | 51.5 | 0.8 | 0.2 | 2.2 |

ECOLOGICAL NOTES

Specialist I on *Bromus erectus*, which is a specific host. *Festuca arundinacea* is an accidental host (Table 3; Fig. 17).

## *Aceria eximia* SUKHAREVA, 1983

DESCRIPTION

Female (n=10): Body vermiform (Figs 18-19). Body length 222-275; width 52-62. Gnathosoma 24-30 long; chelicerae 23-30 long.

Prodorsal shield: 39-44 long, 39-47 wide. Anterior half triangular, posterior half semicircular. Little, rounded lobe over the base of chelicerae. Sculpture: median line absent; admedian lines on 1/2-1/3 rear half of shield; I and II submedian lines forming rhomb-like figures over tubercles bearing *sc* setae; dashes between admedian and I submedian lines. Tubercles of setae *sc* on rear margin of shield, setae *sc* 51-65 long, 25-30 apart, projecting to rear. Numerous lines with minute, conical microtubercles present on surface near shield.

Coxae: with a pattern of slender lines. Sternal line slender.

Opisthosoma with 54-68 dorsal annuli, 56-66 ventral annuli, 5-9 coxigenital annuli. Annuli with microtubercles: dorsal conical, not pointed, set along annuli margins, on telosomal annuli minute, subrounded; ventral subrounded, on telosomal annuli elongated.

Leg I: 37-45; femur 10-11, seta *bv* 11-15; genu 5-7, seta *l"* 29-33; tibia 8-10, seta *l'* 8-14; tarsus 9-10, setae: *ft"* 29-35; *ft'* 24-30, *u'* 7-10; solenidion $\omega$ 10-11; empodium 11-12, simple, 6-7-rayed, symmetrical. Position of setae: *bv* 5-6; *l"* 3-4; *l'* 3-5; *ft"* and *ft'* 3-4; *u'* 5-7.

Leg II: 34-41; femur 10-11, *bv* 12-19; genu 5-6, *l"* 11-14; tibia 6-8; tarsus 8-10, *ft"* 29-36, *ft'* 10-14, *u'* 6-10; solenidion $\omega$ 10-12; empodium 11-12, 6-7-rayed, symmetrical. Position of setae: *bv* 4-5; *l"* 3-4; *ft"* and *ft'* 2-3; *u'* 5-6.

Genital parts 15-19 long, 21-23 wide, genital coverflap with 9-12 longitudinal ribs.

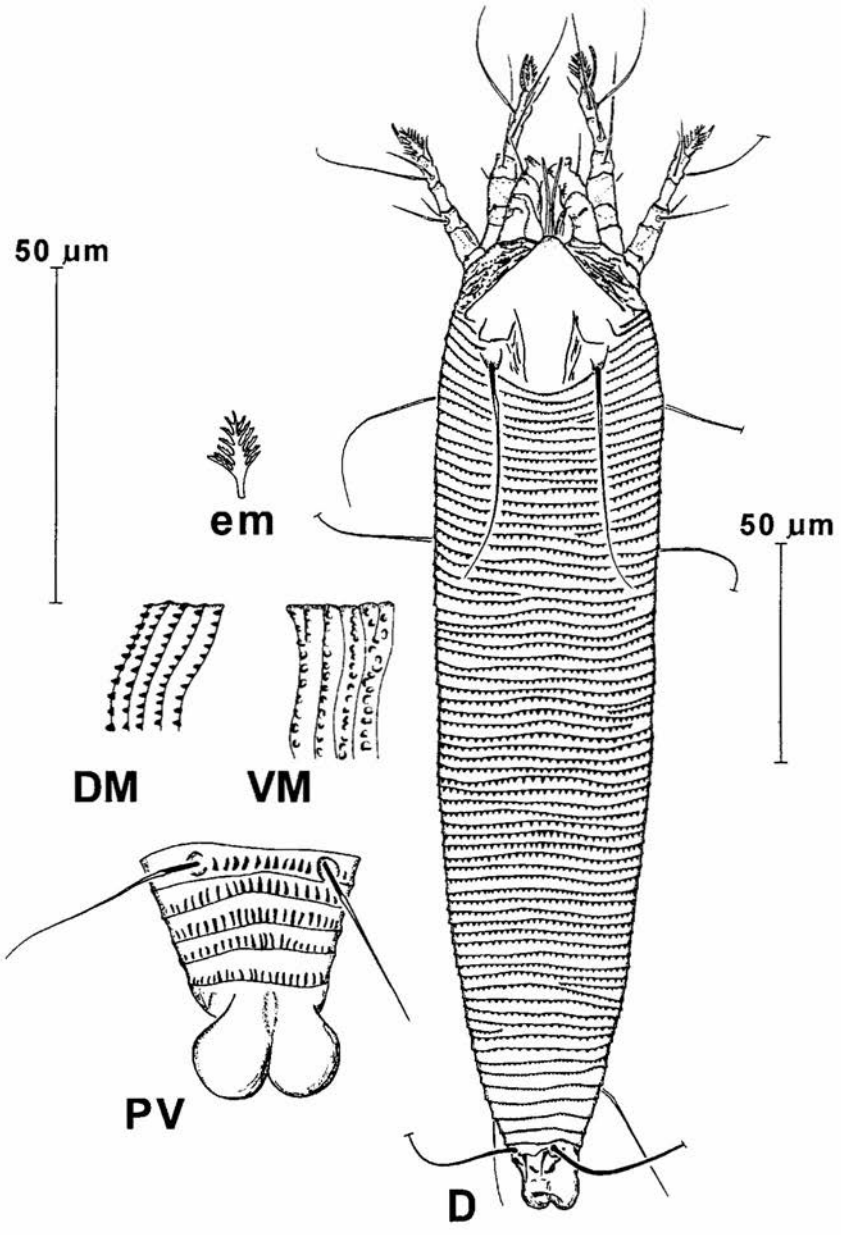
Length of setae: pedipalpal: *d* 10-11; *v* 2-3; *ep* 4; coxal: *1b* 8-11; *1a* 18-25; *2a* 40-53; opisthosomal: *c2* 33-43; *d* 38-57; *e* 24-52; *f* 29-33; *h1* 7-10; *h2* 76-90; *3a* 12-23.

Distance between tubercles bearing setae: coxal: *1b* 11-17; *1a* 7-10; *2a* 23-28; *1b* and *1a* 10-11; *1a* and *2a* 8-10; opisthosomal: *c2* 44-56; *d* 30-36; *e* 17-20; *f* 18-21; *3a* 16-18; telosomal: *h1* 6-7; *h2* 9-11; *h1* and *h2* 2-3.

Number of ventral annuli bearing setae: *c2* 7-9; *d* 18-22; *e* 32-38; *f* 52-62, 5 from rear.

Male (n=7): Body vermiform. Body length 197-214; width 48-51. Gnathosoma 22-26 long; chelicerae 18-24 long.

Prodorsal shield: 34-44 long, 35-40 wide. Shape and sculpture similar to that of female. Tubercles of setae *sc* on rear margin of shield, setae *sc* 33-48 long, 23-27 apart, projecting to rear.

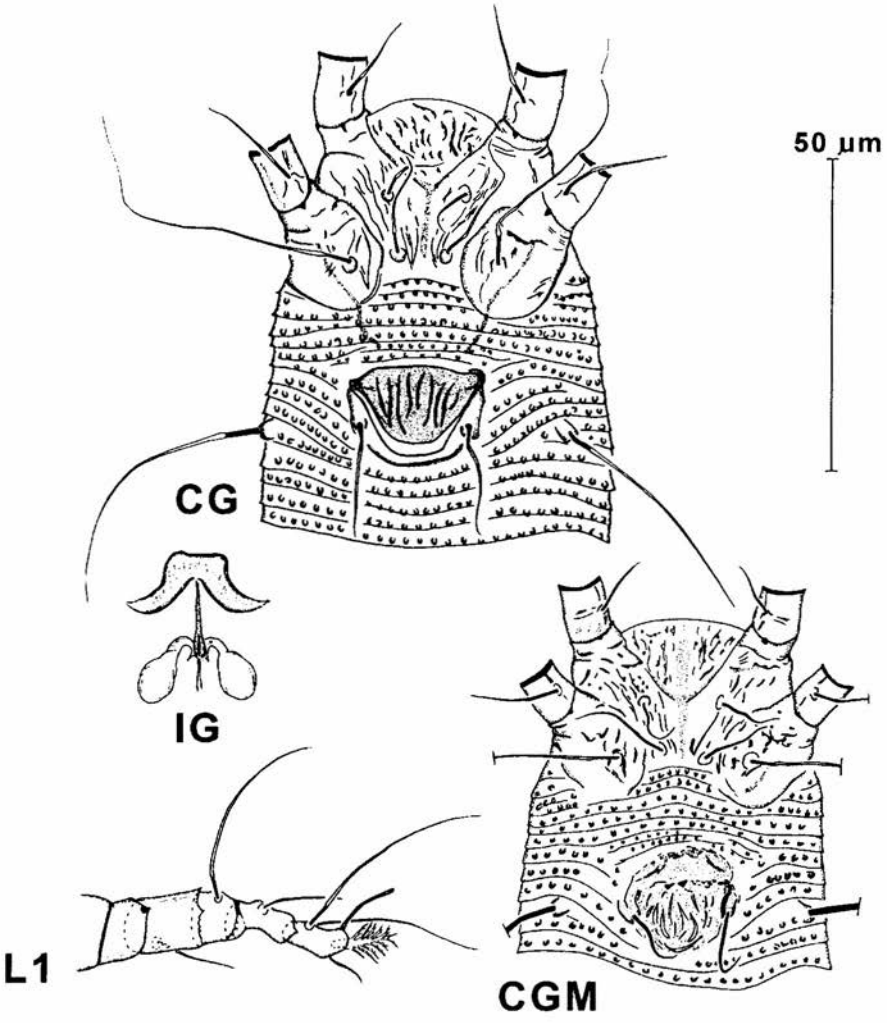



18. *Aceria eximia* SUKHAREVA, female: D – dorsal aspect, DM – dorsal microtubercles, PV – ventral telosoma, VM – ventral microtubercles, em – empodium

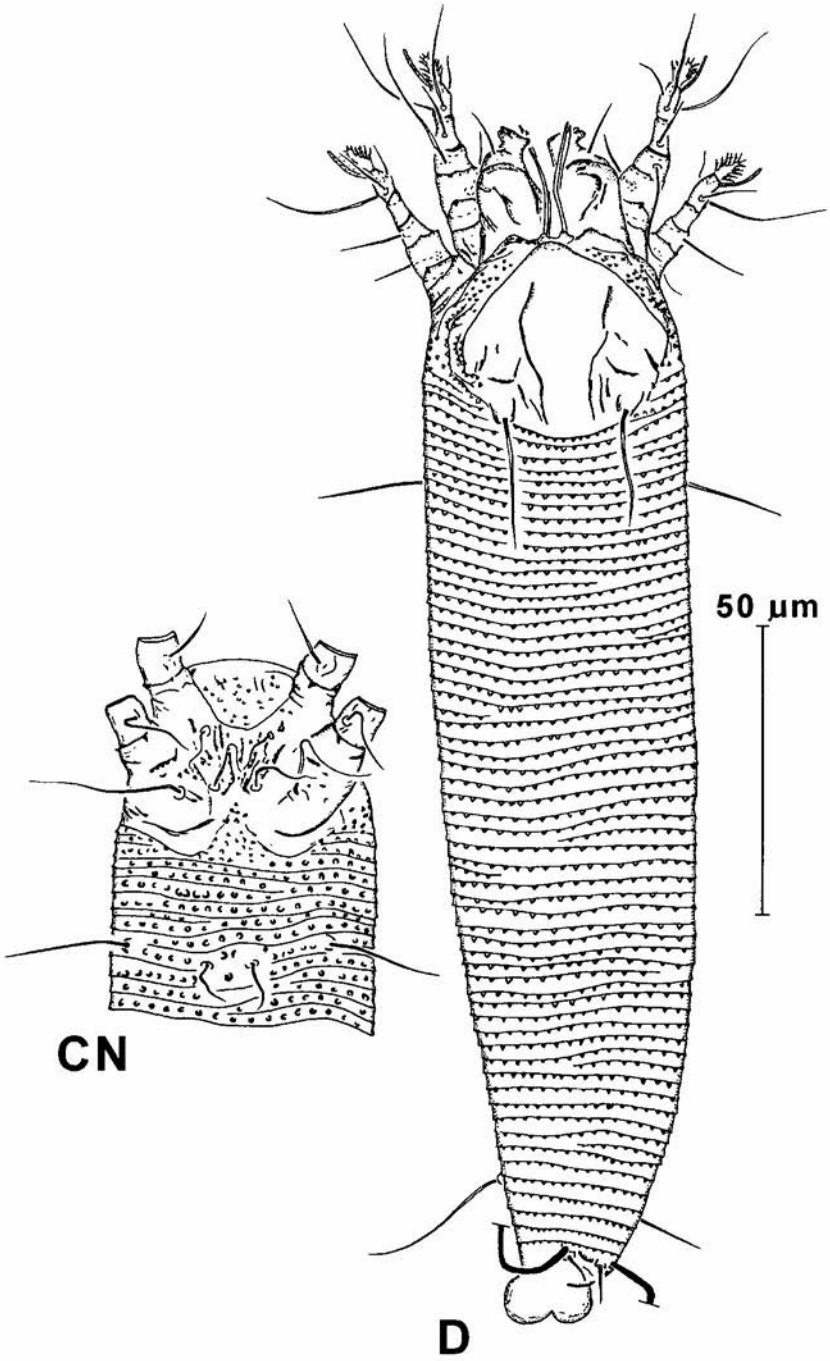
Coxae: with a pattern similar to that of female (Fig. 19).

Opisthosoma with 52-56 dorsal annuli, 50-60 ventral annuli, 5-8 coxigenital annuli. Annuli with microtubercles: dorsal conical, pointed, set along annuli margins; ventral rounded, ahead of annuli margins.

Leg I: 33-37; femur 9-10, seta *bv* 10-13; genu 5-6, seta *l''* 26-29; tibia 6-8, seta *l'* 9-11; tarsus 8-9, setae: *ft''* 27-30; *ft'* 20-26, *u'* 6-8; solenidion $\omega$ 9-10; empodium 10-11, simple, 6-7–rayed, symmetrical. Position of setae: *bv* 4-6; *l''* 3-4; *l'* 3-4; *ft''* and *ft'* 2-3; *u'* 5-7.



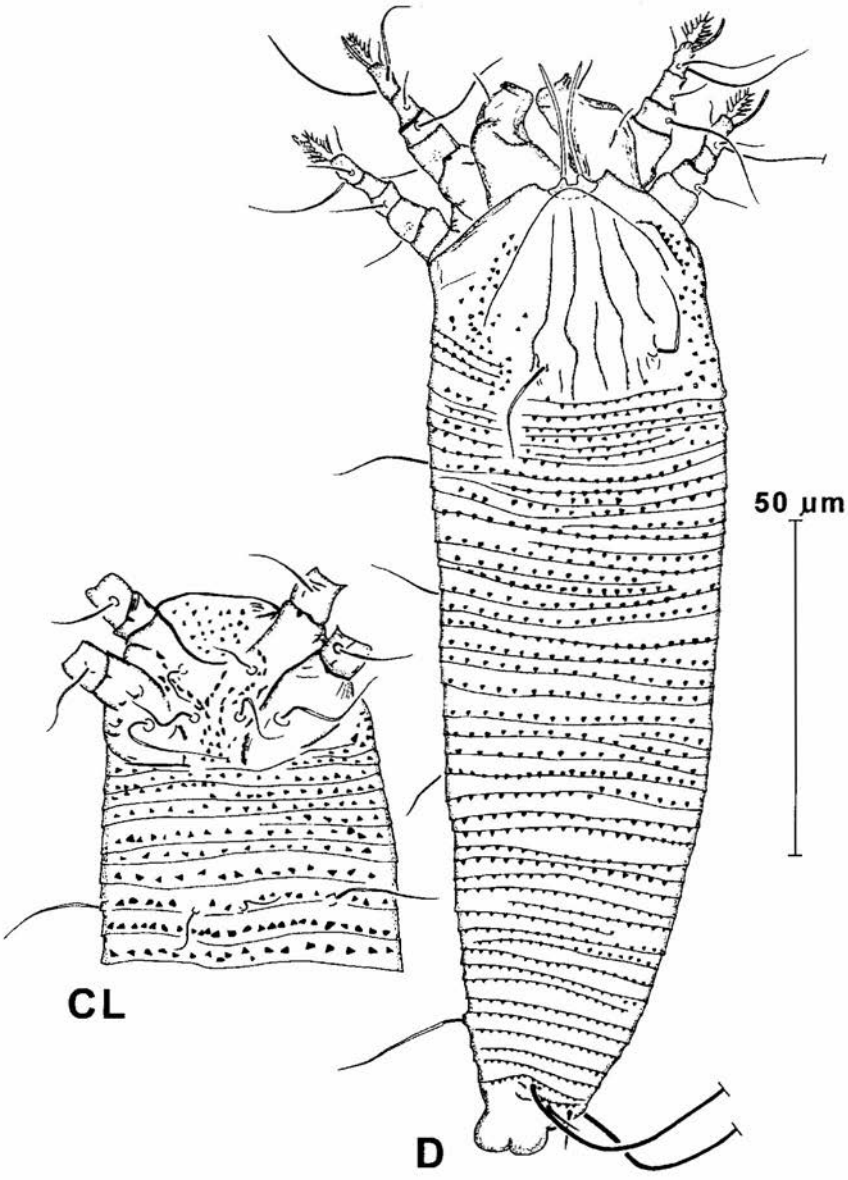

19. *Aceria eximia* SUKHAREVA: CG – coxigenital region of female, CGM – coxigenital region of male, IG – internal genitalia of female, L1 – leg I of female




20. *Aceria eximia* SUKHAREVA, nymph: CN – coxisternum and *3a* and *c2* setae, D – dorsal aspect

Leg II: 31-33; femur 8-10, *bv* 13-15; genu 5-6, *l"* 10-17; tibia 6-7; tarsus 8-9, *ft"* 26-28, *ft'* 8-11, *u'* 6-7; solenidion $\omega$ 10-11; empodium 9-10, 6-rayed, symmetrical. Position of setae: *bv* 4-5; *l"* 3; *ft"* and *ft'* 3; *u'* 5.

Genital parts 11-17 long, 18-19 wide, surface below the eugenital setae with lines (Fig. 19).




21. *Aceria eximia* SUKHAREVA, larva: CL – coxisternum and *3a* and *c2* setae, D – dorsal aspect

Length of setae: pedipalpal: *d* 8-10; *v* 2; *ep* 4; coxal: *1b* 7-10; *1a* 14-17; *2a* 35-43; opisthosomal: *c2* 24-33; *d* 33-38; *e* 20-38; *f* 23-35; *3a* 13-16; telosomal: *h1* 5-8, *h2* 67-81.

Distance between tubercles bearing setae: coxal: *1b* 11-17; *1a* 7-10; *2a* 23-28; *1b* and *1a* 10 11; *1a* and *2a* 8-10; opisthosomal: *c2* 38-45; *d* 26-29; *e* 14-16; *f* 15-19; *3a* 14-16; telosomal: *h1* 5-6; *h2* 9-10; *h1* and *h2* 2-3.

Number of ventral annuli bearing setae: *c2* 7-9; *d* 14-19; *e* 27-34; *f* 46-56, 5 from rear.

Nymph (n=10) (Fig. 20): Body vermiform. Body length 192-229; width 45-53. Gnathosoma 22-26 long; chelicerae 21-25 long.

Prodorsal shield: 35-38 long, 36-39 wide. Shape and sculpture: similar to that of female. Tubercles of setae *sc* on rear margin of shield, setae *sc* 19-28 long, 20-24 apart, projecting to rear. Surface near shield with conical microtubercles.

Coxae: slender line and conical microtubercles. Sternal line absent.

Opisthosoma with 51-58 dorsal annuli, 49-55 ventral annuli, 8-13 coxigenital annuli. Annuli with microtubercles: similar to that of female.

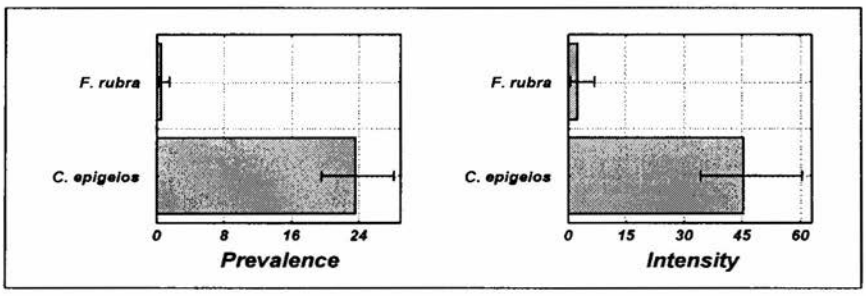
Leg I: 29-36; femur 8-9, seta *bv* 8-12; genu 4-5, seta *l''* 21-27; tibia 6-7, seta *l'* 7-10; tarsus 6-8, setae: *ft''* 21-23; *ft'* 17-22, *u'* 5-7; solenidion *ω* 8-9; empodium 7-10, simple, 6–rayed, symmetrical. Position of setae: *bv* 3-5; *l''* 2-3; *l'* 2-3; *ft''* and *ft'* 2-3; *u'* 4-5.

Leg II: 26-31; femur 7-8, *bv* 10-14; genu 4-5, *l''* 9-12; tibia 4-6; tarsus 6-8, *ft''* 19-25, *ft'* 8-11, *u'* 6-7; solenidion *ω* 8-10; empodium 8-10, 6-rayed, symmetrical. Position of setae: *bv* 3-4; *l''* 2-4; *ft''* and *ft'* 2-3; *u'* 4-5.

Length of setae: pedipalpal: *d* 8-10; *v* 2; *ep* 4; coxal: *1b* 5-9; *1a* 9-14; *2a* 19-43; opisthosomal: *c2* 19-25; *d* 29-38; *e* 19-30; *f* 18-42; *3a* 8-13; telosomal: *h1* 5-7.

Distance between tubercles bearing setae: coxal: *1b* 11-13; *1a* 7-10; *2a* 20-24; *1b* and *1a* 8-11; *1a* and *2a* 7-9; opisthosomal: *c2* 35-44; *d* 25-30; *e* 12-17; *f* 15-19; *3a* 8-10; telosomal: *h1* 5-6; *h2* 9-11; *h1* and *h2* 2-3.

Number of ventral annuli bearing setae: *c2* 7-10; *d* 17-21; *e* 29-33; *f* 45-51, 5 from rear.




22. Prevalence, intensity and density of infestation of *Aceria eximia* on *Festuca rubra* and *Calamagrostis epigeios*

Larva (n=1) (Fig. 21): Body vermiform. Body length 157; width 44. Gnathosoma 20 long.

Prodorsal shield: 29 long, 29 wide. Triangular, with little anterior lobe over cheliceral base. Sculpture: median line on rear half; admedian lines complete and sinusoidal; I submedian lines parallel to admedian; II submedian lines absent. Tubercles of setae *sc* ahead from posterior margin of shield, setae *sc* 14 long, 16 apart. Conical microtubercles present on surface near shield

Coxae: slender lines with subrounded microtubercles. Sternal line absent.

Opisthosoma with 50 dorsal annuli, 36 ventral annuli, 6 coxigenital annuli. Annuli with conical microtubercles, set along or slightly ahead of annuli margins.

Leg I: 25; femur 8, seta *bv* 10; genu 5, seta *l"* 17; tibia 4, seta *l'* 6; tarsus 6, setae: *ft"* 20; *ft'* 19, *u'* 6; solenidion *ω* 7; empodium 8, simple, 6–rayed, symmetrical. Position of setae: *bv* 4; *l"* 2; *l'* 2; *ft"* and *ft'* 2; *u'* 4.

Leg II: 24; femur 7, *bv* 11; genu 4, *l"* 8; tibia 4; tarsus 6, *ft"* 17, *ft'* 8, *u'* 6; solenidion *ω* 8; empodium 9, 6-rayed, symmetrical. Position of setae: *bv* 3; *l"* 2; *ft"* and *ft'* 2; *u'* 3.

Length of setae: pedipalpal: *d* 9; *v* 2; *ep* 3; coxal: *1b* 5; *1a* 10; *2a* 29; opisthosomal: *c2* 18; *d* 16; *e* 13; *f* 15; *3a* 7; telosomal: *h1* 3.

Distance between tubercles bearing setae: coxal: *1b* 10; *1a* 7; *2a* 20; *1b* and *1a* 9; *1a* and *2a* 7; opisthosomal: *c2* 36; *d* 23; *e* 12; *f* 14; *3a* 7; telosomal: *h1* 5; *h2* 9; *h1* and *h2* 3.

Number of ventral annuli bearing setae: *c2* 7; *d* 13; *e* 20; *f* 32, 5 from rear.

HOST PLANT

*Calamagrostis epigeios* (L.) ROTH. Relation to host plant: vagrant on the upper leaf surface, mostly near the base of leaf, often in the youngest folded leaves and in leaf sheaths; no visible damage.

MATERIAL

452 females, 70 males, 108 nymphs, 6 larvae from Poznań, Lasek Marceliński forest, not mowed meadow near the forest margin [PLM2], 23.09.1999, leg. AS.

Other records: *C. epigeios*: [PC6] - 29.01.2000, (12); [PLM1] - 25.10.1998, (20); 11.01.1999, (31); 26.01.1999, (30); 23.09.1999, (34); 23.10.1999, (443); 27.12.1999, (82); 29.02.2000, (162); 29.03.2000, (111); [PLM2] - 25.10.1998, (26); 23.05.1999, (27); 20.06.1999, (67); 8.11.1999, (264); 27.12.1999, (723);

Table 4

Parameters of infestation of *Aceria eximia*. For legend see Table 2.

| Host species | *n* | *k* | *P* | *LCI* | *UCI* | *I* | *LCI* | *UCI* | *D* | *LCI* | *UCI* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. *Calamagrostis epigeios** | 397 | 94 | 23.7 | 19.6 | 28.2 | 45.2 | 34.3 | 60.5 | 10.7 | 8.1 | 14.3 |
| 2. *Festuca rubra**** | 682 | 4 | 0.6 | 0.2 | 1.5 | 2.3 | 0.5 | 6.8 | 0.0 | 0.0 | 0.0 |

22.01.2000, (931); 29.02.2000, (620); 29.03.2000, (26); *Festuca rubra*: [PC16] - 27.12.1999, (11).

ECOLOGICAL NOTES

Specialist I on *Calamagrostis epigeios*, which is a specific host. *Festuca rubra* is an accidental host (Table 4, Fig. 22)

GENERAL DISTRIBUTION

Palearctic Region. The species so far was recorded in Russia in Belgrod province on *C. epigeios* (SUKHAREVA 1983) and in Poland (SKORACKA & KOZŁOWSKI 2002).

### *Aceria flexuosae* n. sp.

DIAGNOSIS

*Aceria flexuosae* is the most similar to *Aceria insularis* SUKHAREVA, 1985 (*Elymus mollis* (TRIN.) HARA, Poaceae, Rosja) by the sculpture of the prodorsal shield: lines short, present on 1/3 posterior part of the shield, and number of dorsal and ventral annuli (74 and 71 in *A. insularis*, 75 and 68 in *A. flexuosae*).

*A. flexuosae* can be distinguished from *A. insularis* by the shape and localisation of dorsal microtubercles, which are large, rounded and ahead from annuli margins in *A. insularis*, however are sickle-shaped and set along annuli margins in *A. flexuosae*. Those two species differ also in the width of the prodorsal shield (40 in *A. insularis*, 25 in *A. flexuosae*) and the length of setae: *c2* (50 in *A. insularis*, 17 in *A. flexuosae*), *d* (45 in *A. insularis*, 21 in *A. flexuosae*), *e* (40 in *A. insularis*, 15 in *A. flexuosae*) and *3a* (22 in *A. insularis*, 9 in *A. flexuosae*).

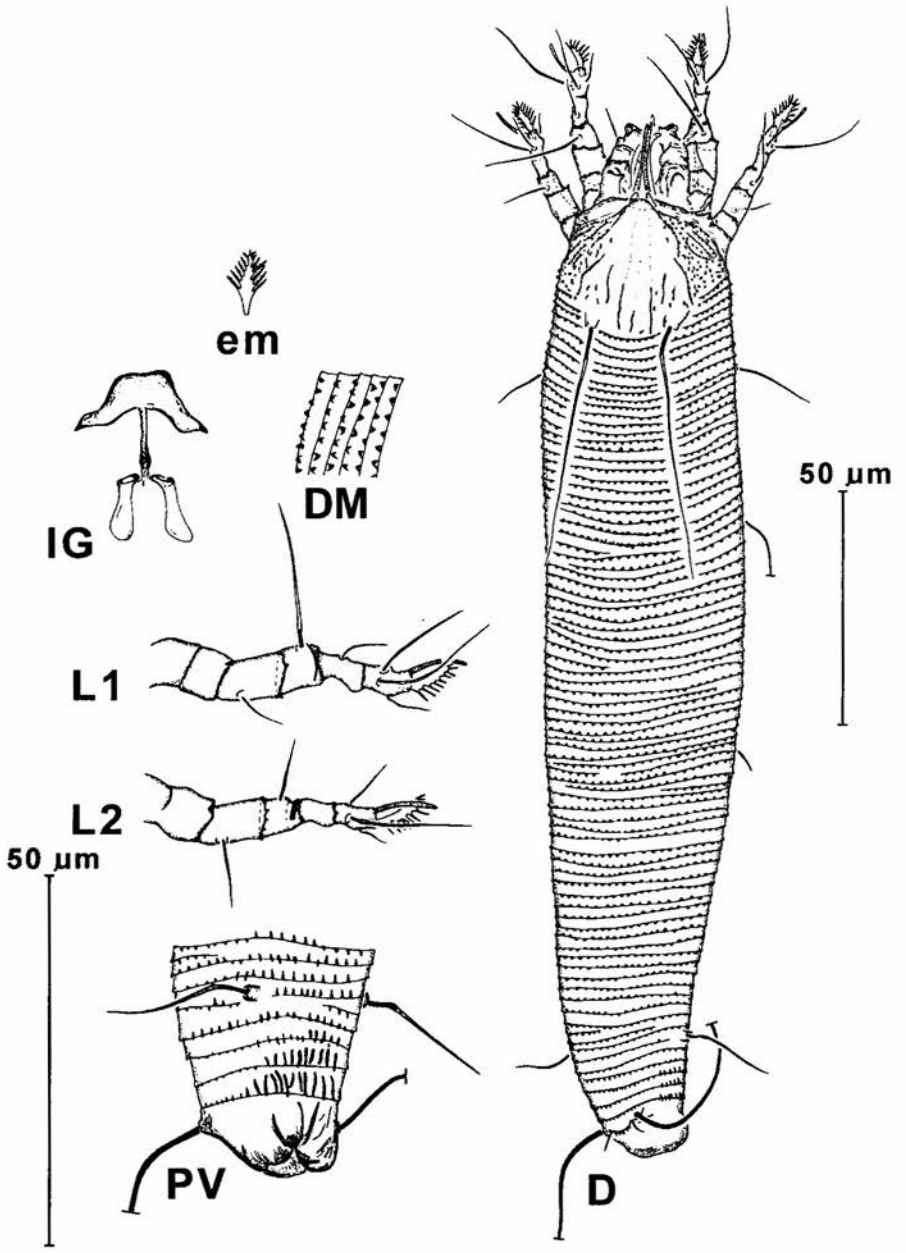
DESCRIPTION

Female (n=11) (Figs 23-24): Body vermiform. Body length 213 (199-254); width 38 (40-43). Gnathosoma 19 (18-20) long; chelicerae 19 (17-20) long.

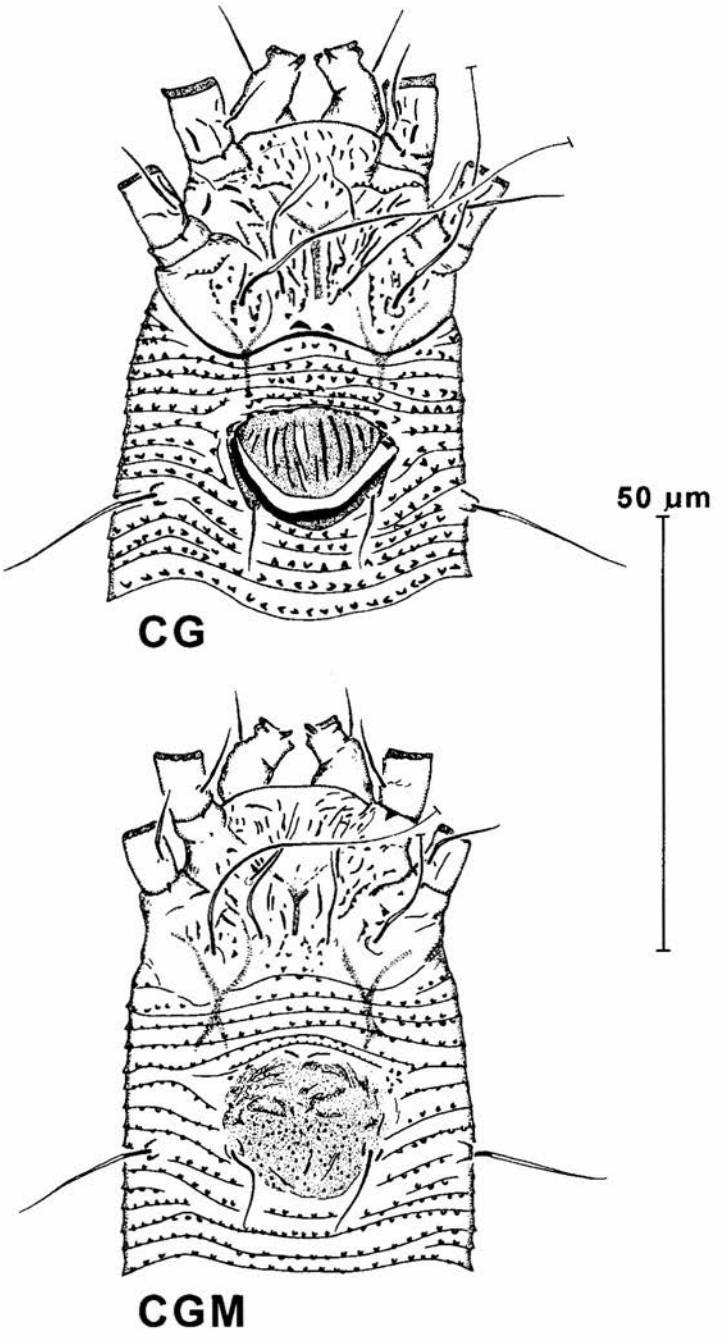
Prodorsal shield: 30 (23-33) long, 25 (26-29) wide. Triangular with little, subrounded lobe reaching the half of cheliceral base. Sculpture: median line on rear 1/5 of shield; admedian lines twice as long and parallel to median; I submedian lines as long as median line, longitudinal and situated above tubercles bearing *sc* setae; conical, not pointed microtubercles present between I submedian lines and lateral margin of shield. Tubercles of setae *sc* on rear margin of shield, setae *sc* 55 (49-60) long, 16 (18-20) apart, projecting to rear. Numerous, minute, conical microtubercles on surface near shield.

Coxae: with a pattern of large, conical microtubercles and numerous lines with minute, conical microtubercles. Sternal line slender.

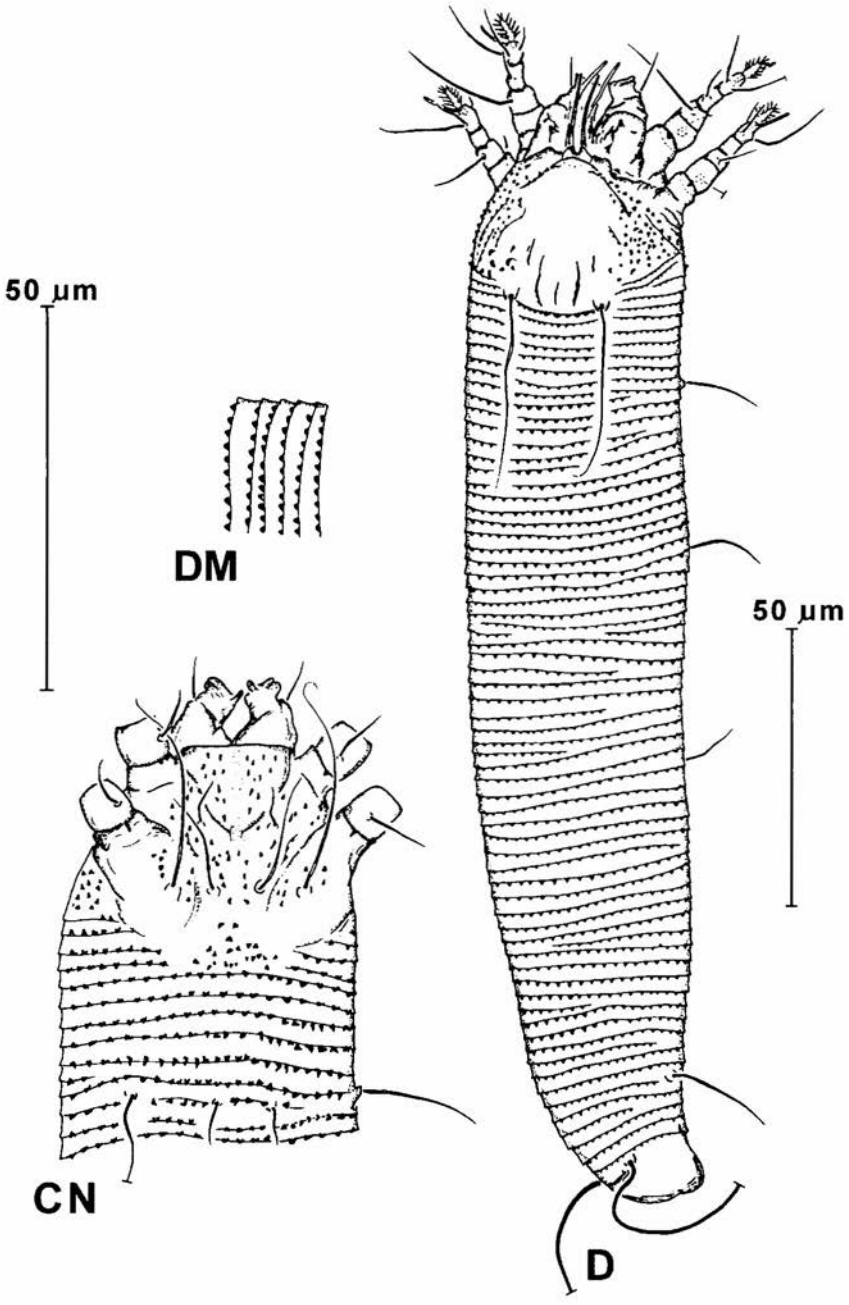
Opisthosoma with 75 (70-80) dorsal annuli, 68 (68-77) ventral annuli, 5 (5-6) coxigenital annuli. Annuli with sickle-shaped microtubercles: dorsal set along annuli margins, on telosomal annuli minute and conical; ventral minute, slightly ahead of annuli margins, on telosomal annuli conical, pointed and elongated.



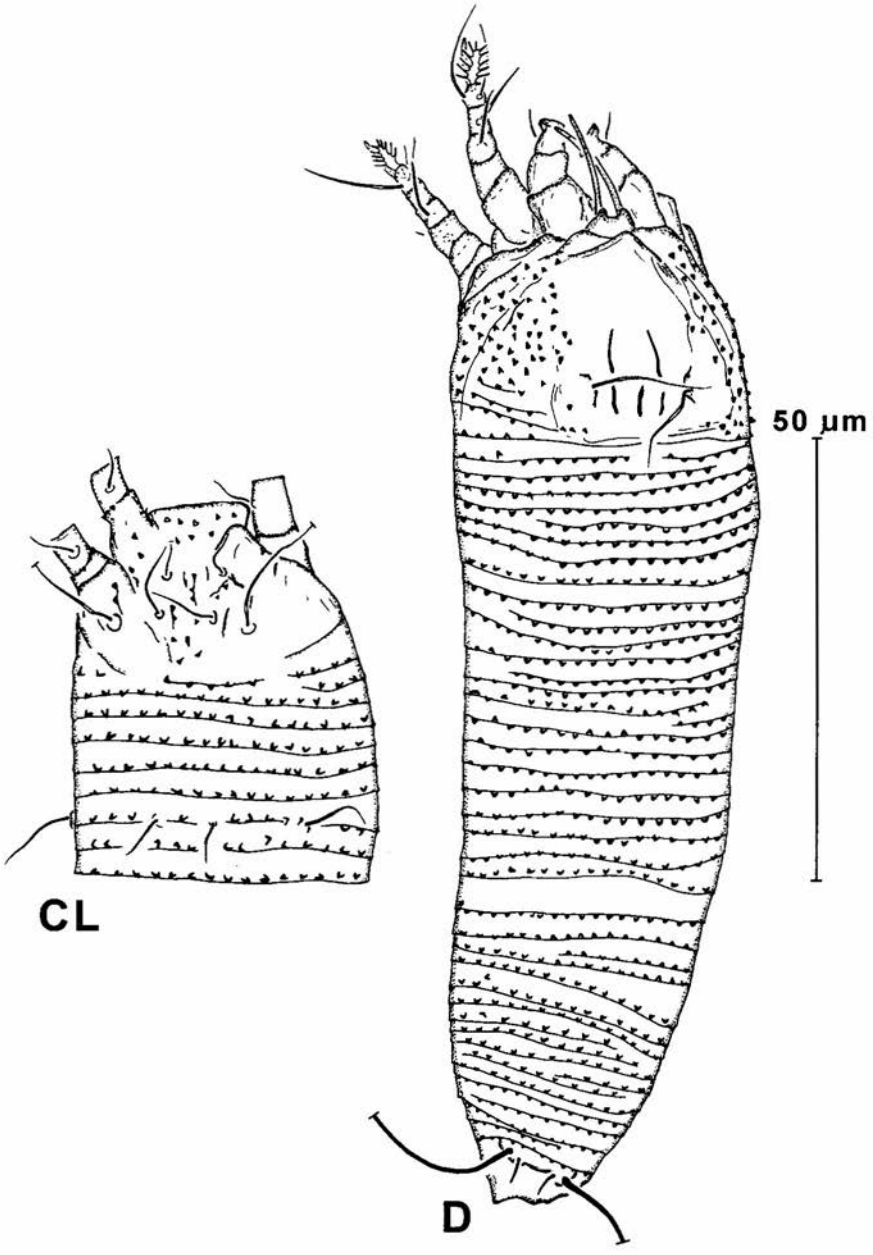

23. *Aceria flexuosae* n. sp., female: D – dorsal aspect, DM – dorsal microtubercles, IG – internal genitalia, L1, L2 – legs I and II, PV – ventral telosoma, em - empodium




24. *Aceria flexuosae* n. sp.: CG – coxigenital region of female, CGM – coxigenital region of male




25. *Aceria flexuosae* n. sp., nymph: CN – coxisternum and *3a* and *c2* setae, D – dorsal aspect, DM – dorsal microtubercles




26. *Aceria flexuosae* n. sp., larva: CL – coxisternum and *3a* and *c2* setae, D – dorsal aspect

Leg I: 33 (29-31); femur 9 (8-9), seta *bv* 9 (8-11); genu 5 (5-6), seta *l"* 21 (18-21); tibia 6 (6-7), seta *l'* 6 (6-8); tarsus 7 (6-7), setae: *ft"* 19 (18-22); *ft'* 13 (11-14), *u'* 5 (4-7); solenidion *ω* 8 (7-8), slightly bent; empodium 9 (8-10), simple, 7-rayed, symmetrical. Position of setae: *bv* 4 (4-5); *l"* 3 (3-4); *l'* 2 (2-3); *ft"* and *ft'* 2 (2-3); *u'* 4 (3-5).

Leg II: 28 (27-29); femur 9 (8-9), *bv* 9 (7-9); genu 5 (4-5), *l"* 8 (9-10); tibia 5 (4-5); tarsus 6 (6-7), *ft"* 20 (16-22), *ft'* 9 (5-8), *u'* 4 (5-6); solenidion *ω* 8 (8-9), slightly bent; empodium 10 (8-10), 7-rayed, symmetrical. Position of setae: *bv* 4 (4); *l"* 3 (2-3); *ft"* and *ft'* 2 (2); *u'* 4 (3-4).

Genital parts 13 (13-15) long, 19 (18-22) wide, genital coverflap with 11 (10-13) longitudinal ribs.

Length of setae: pedipalpal: *d* 8 (6-10); *v* 2 (2); *ep* (3); coxal: *1b* 6 (6-9); *1a* 16 (11-19); *2a* 35 (29-38); opisthosomal: *c2* 17 (10-19); *d* 21 (17-24); *e* 15 (12-20); *f* 17 (17-23); *3a* 9 (6-10); *h1* 4 (2-5); *h2* 54 (48).

Distance between tubercles bearing setae: coxal: *1b* 9 (10-11); *1a* 7 (6-8); *2a* 17 (17-20); *1b* and *1a* 9 (7-10); *1a* and *2a* 6 (6-9); opisthosomal: *c2* 35 (33-38); *d* 23 (23-28); *e* 11 (13-17); *f* 16 (15-19); *3a* 13 (13-14); *h1* 6 (6); *h2* 8 (9-10); *h1* and *h2* 2 (2).

Number of ventral annuli bearing setae: *c2* 8 (7-9); *d* 19 (20-25); *e* 35 (37-43); *f* 64 (64-73), 5 (5) from rear.

Male (n=4): Body vermiform. Body length 199; width 40. Gnathosoma 18 long; chelicerae 17 long.

Prodorsal shield: 28 long, 28 wide. Shape and sculpture similar to that of female. Tubercles of setae *sc* on rear margin of shield, setae *sc* 41-43 long, 19 apart, projecting to rear.

Coxae: with a pattern of few microtubercles and lines (Fig. 24).

Opisthosoma with 69-71 dorsal annuli, 65-67 ventral annuli, 5 coxigenital annuli. Annuli with conical microtubercles smaller than that of female: dorsal not pointed, set along annuli margins, on telosomal annuli pointed; ventral slightly pointed and ahead from annuli margins.

Leg I: 28-30; femur 7-8, seta *bv* 6-8; genu 4-5, seta *l"* 17-21; tibia 4-5, seta *l'* 6-7; tarsus 6, setae: *ft"* 18-19; *ft'* 11, *u'* 5; solenidion *ω* 7-8; empodium 8, simple, 6–7-rayed, symmetrical. Position of setae: *bv* 4; *l"* 2-3; *l'* 2-3; *ft"* and *ft'* 2; *u'* 4.

Leg II: 25-27; femur 7-9, *bv* 9; genu 4, *l"* 8-9; tibia 4-5; tarsus 5-6, *ft"* 17, *ft'* 7, *u'* 5; solenidion *ω* 8; empodium 8-9, 6-7-rayed, symmetrical. Position of setae: *bv* 4; *l"* 2; *ft"* and *ft'* 2; *u'* 4.

Genital parts 14-16 long, 17 wide, surface below the eugenital setae with minute, conical and rounded microtubercles (Fig. 24).

Length of setae: pedipalpal: *d* 6-8; *v* 2; coxal: *1b* 10; *1a* 15; *2a* 38; opisthosomal: *c2* 16-17; *d* 16-24; *e* 12-17; *f* 19-22; *3a* 7-10; *h1* 4.

Distance between tubercles bearing setae: coxal: *1b* 9-10; *1a* 7-8; *2a* 17-18; *1b* and *1a* 7-10; *1a* and *2a* 6; opisthosomal: *c2* 36; *d* 23; *e* 14; *3a* 12-15; *h1* and *h2* 2.

Number of ventral annuli bearing setae: *c2* 7-8; *d* 16-20; *e* 33-35; *f* 61-62, 5-6 from rear.

Nymph (n=7) (Fig. 25): Body vermiform. Body length 155-209; width 33-41. Gnathosoma 15-19 long; chelicerae 16-19 long.

Prodorsal shield: 27-30 long, 24-26 wide. Triangularly-oval, with little subrounded lobe reaching 1/2 of cheliceral base. Sculpture: similar to that of female. Tubercles of setae *sc* on rear margin of shield, setae *sc* 27-38 long, 15-17 apart, projecting to rear.

Coxae: conical and not pointed microtubercles forming lines round about tubercles bearing coxal setae. Sternal line absent.

Opisthosoma with 53-68 dorsal annuli, 49-59 ventral annuli, 7-10 coxigenital annuli. Annuli with conical microtubercles: dorsal not pointed, set along annuli margins; ventral little pointed, set along or slightly ahead of annuli margins.

Leg I: 23-26; femur 6-7, seta *bv* 8; genu 3-4, seta *l"* 12-18; tibia 4-5, seta *l'* 5-6; tarsus 4-6, setae: *ft"* 12-19; *ft'* 8, *u'* 4-5; solenidion *ω* 5-7; empodium 6-8, simple, 5-7-rayed, symmetrical. Position of setae: *bv* 3-4; *l"* 2; *l'* 2; *ft"* and *ft'* 2; *u'* 3.

Leg II: 22-23; femur 6-7, *bv* 7; genu 4, *l"* 8-9; tibia 3-4; tarsus 5, *ft"* 15-18, *u'* 5; solenidion *ω* 5-7; empodium 6-7, 5-7-rayed, symmetrical. Position of setae: *bv* 3; *l"* 2; *ft"* and *ft'* 2; *u'* 2-3.

Length of setae: pedipalpal: *d* 7-8; *v* 2; *ep* 3; coxal: *1b* 6; *1a* 14; *2a* 25; opisthosomal: *c2* 10 15; *d* 12-20; *e* 10-13; *f* 15-20; *3a* 6-9; *h1* 2-4.

Distance between tubercles bearing setae: coxal: *1b* 9; *1a* 6; *2a* 15-18; *1b* and *1a* 8-9; *1a* and *2a* 6; opisthosomal: *c2* 29-33; *d* 21-25; *e* 11-14; *f* 12-18; *3a* 7-9; *h1* 5; *h2* 9; *h1* and *h2* 2.

Number of ventral annuli bearing setae: *c2* 6-9; *d* 15-21; *e* 25-35; *f* 45-55, 5 from rear.

Larva (n=1) (Fig. 26): Body vermiform. Body length 127. Gnathosoma 13 long; chelicerae 14 long.

Prodorsal shield: 24 long, 22 wide. Rectangular, with indistinct lateral margin, without anterior lobe. Sculpture: median and admedian lines similar to that of female; submedian lines absent. Tubercles of setae *sc* ahead from posterior margin of shield; setae *sc* 14 long, 10 apart, projecting to centre of shield.

Coxae: few, large, triangular microtubercles. Sternal line absent.

Opisthosoma with 43 dorsal annuli, 29 ventral annuli. Annuli with conical microtubercles: dorsal large, not pointed, set along annuli margins; ventral larger than dorsal, slightly ahead of annuli margins.

Leg I: 22; genu 4, seta *l"* 9; tibia 4; tarsus 3; solenidion *ω* 5; empodium 6, simple, 5-rayed, symmetrical. Position of setae: *l"* 3; *l'* 2; *ft"* and *ft'* 2; *u'* 3.

Leg II: 16; femur 4; genu 3; tibia 3; tarsus 3; solenidion *ω* 5; empodium 6, 5-rayed, symmetrical. Position of setae: *bv* 2; *l"* 2; *ft"* and *ft'* 1; *u'* 2.

Length of setae: coxal: *1a* 7; *2a* 15; opisthosomal: *c2* 7; *d* 8; *e* 6; *f* 10; *3a* 5.

Distance between tubercles bearing setae: opisthosomal: *c2* 27; *d* 16; *e* 10; *f* 14; *3a* 6; *h1* 4; *h2* 8; *h1* and *h2* 2.

Number of ventral annuli bearing setae: *c2* 6; *d* 11; *e* 17; *f* 27, 3 from rear.

HOST PLANT

*Deschampsia flexuosa* (L.) TRIN. Relation to host plant: vagrant on the upper leaf surface, no visible damage.

TYPE MATERIAL

Female holotype, 68 female paratypes, 24 male paratypes, 36 nymph paratypes, 8 larvae paratypes.

Type locality: Obrzycko near Poznań, dry pinewood [OP1], 11.06.2000, leg. AS.

ETYMOLOGY

The specific designation is derived from the specific name of type host plant - *D. flexuosa.*

ECOLOGICAL NOTES

Specialist I, found on *D. flexuosa* - specific host. The values of its infestation ($n$=10; $k$=4): $P$=40.0% (*Cl:* 12.2%-73.8%); $I$=54.8 (*Cl:* 10.5-133.8) specimens per shoot; $D$=21.9 (*Cl:* 4.2-53.5) specimens per shoot.

## ***Aceria glomerivagrans* n. sp.**

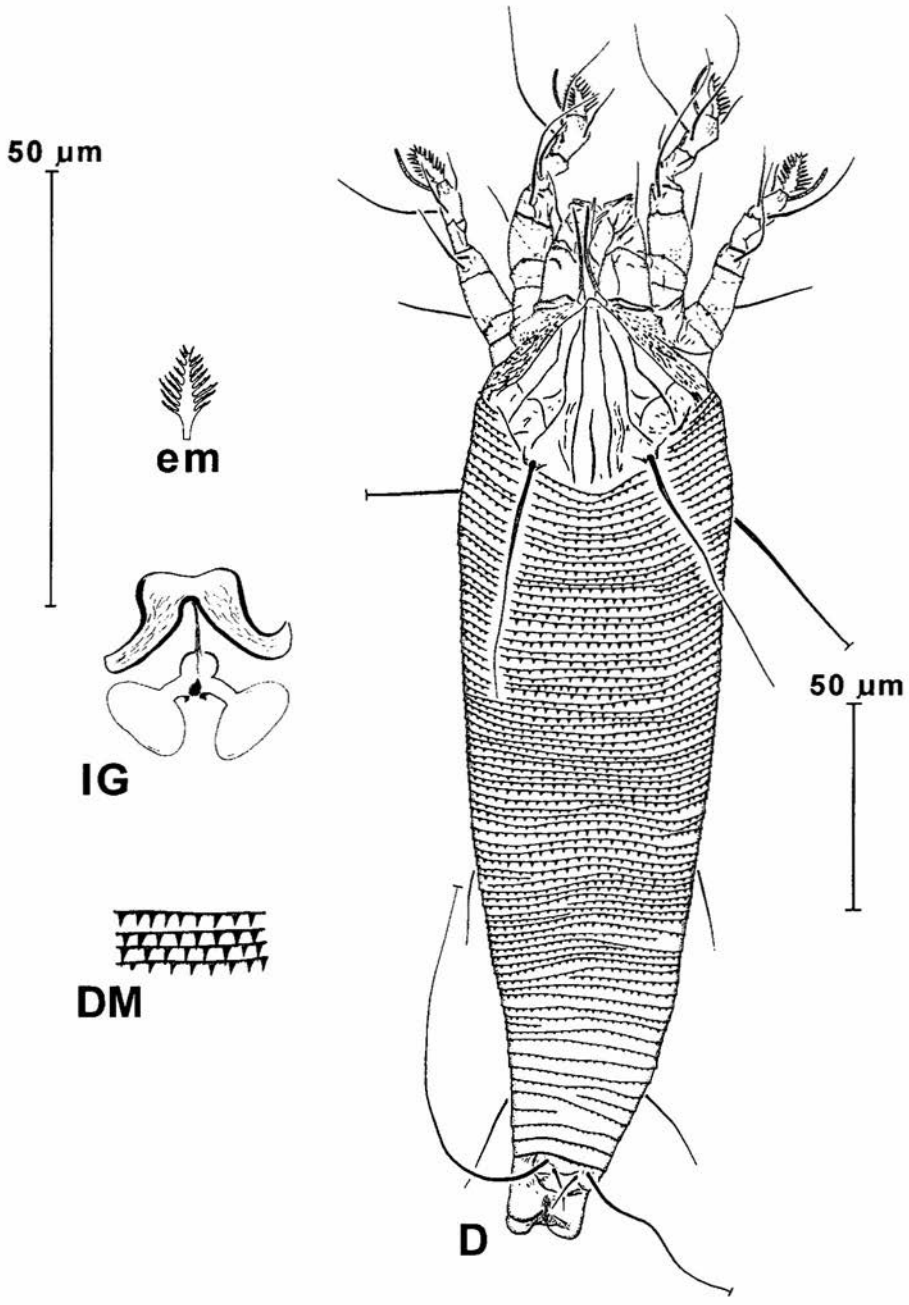
DIAGNOSIS

*Aceria glomerivagrans* is the most similar to *Aceria tosichella* KEIFER, 1969 (*Triticum aestivum* L., Poaceae, Yugoslavia) by the pointed dorsal microtubercles, and the length of median and I submedian lines.

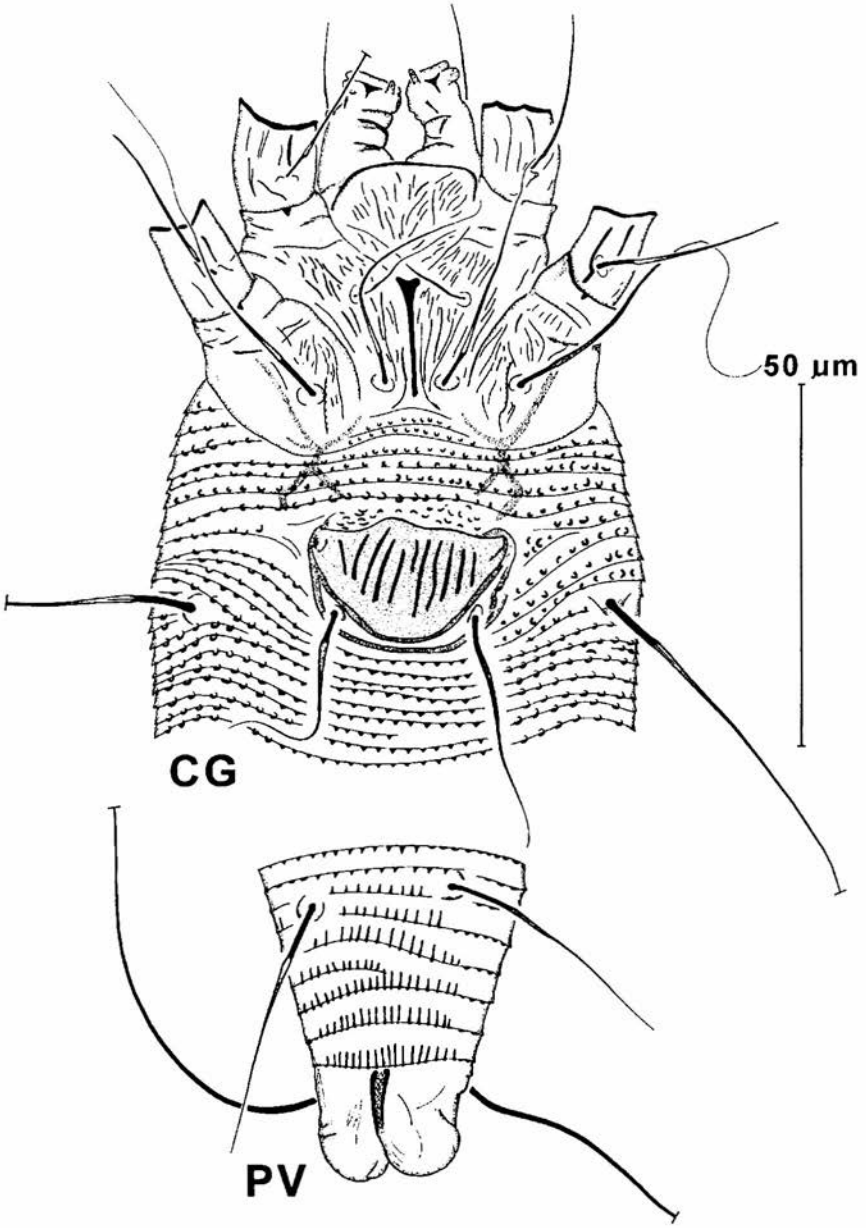
*A. glomerivagrans* can be distinguished from *A. tosichella* by the length and shape of II submedian lines, which are arched and shorter than the half of prodorsal shield in *A. tosichella*, however in *A. glomerivagrans* are parallel to I submedian lines and are longer than the half of prodorsal shield. Besides, there are arched, transversal lines in the prodorsal shield of *A. glomerivagrans*, which are absent in the prodorsal shield of *A. tosichella.* Those species differ also in the length of tarsus II (7.5 in *A. tosichella,* 10 in *A. glomerivagrans*) and setae *e* (50-60 in *A. tosichella,* 25 in *A. glomerivagrans*).

DESCRIPTION

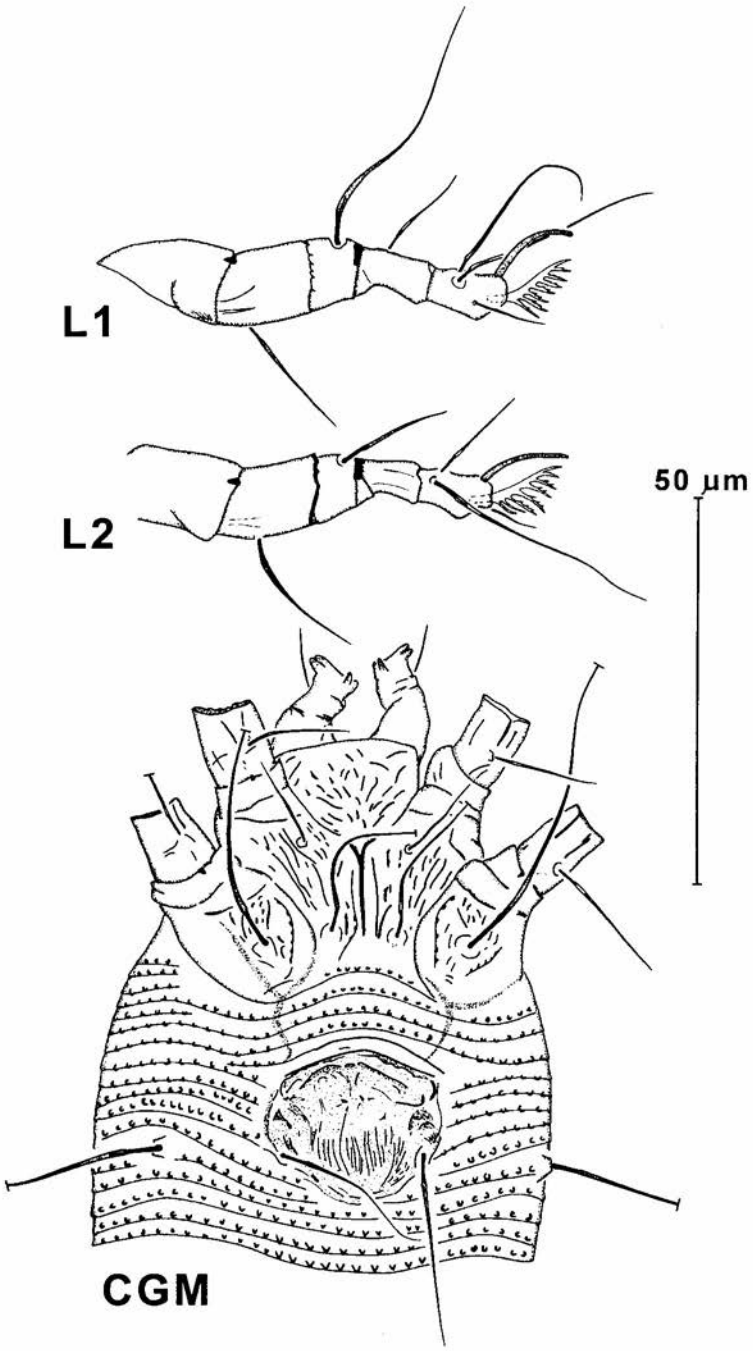
Female (n=17) (Figs 27-29): Body vermiform. Body length 258 (186-275); width 59 (56-67). Gnathosoma 29 (22-29) long; chelicerae 24 (21-26) long.




27. *Aceria glomerivagrans* n. sp., female: D – dorsal aspect, DM – dorsal microtubercles, IG – internal genitalia, em - empodium

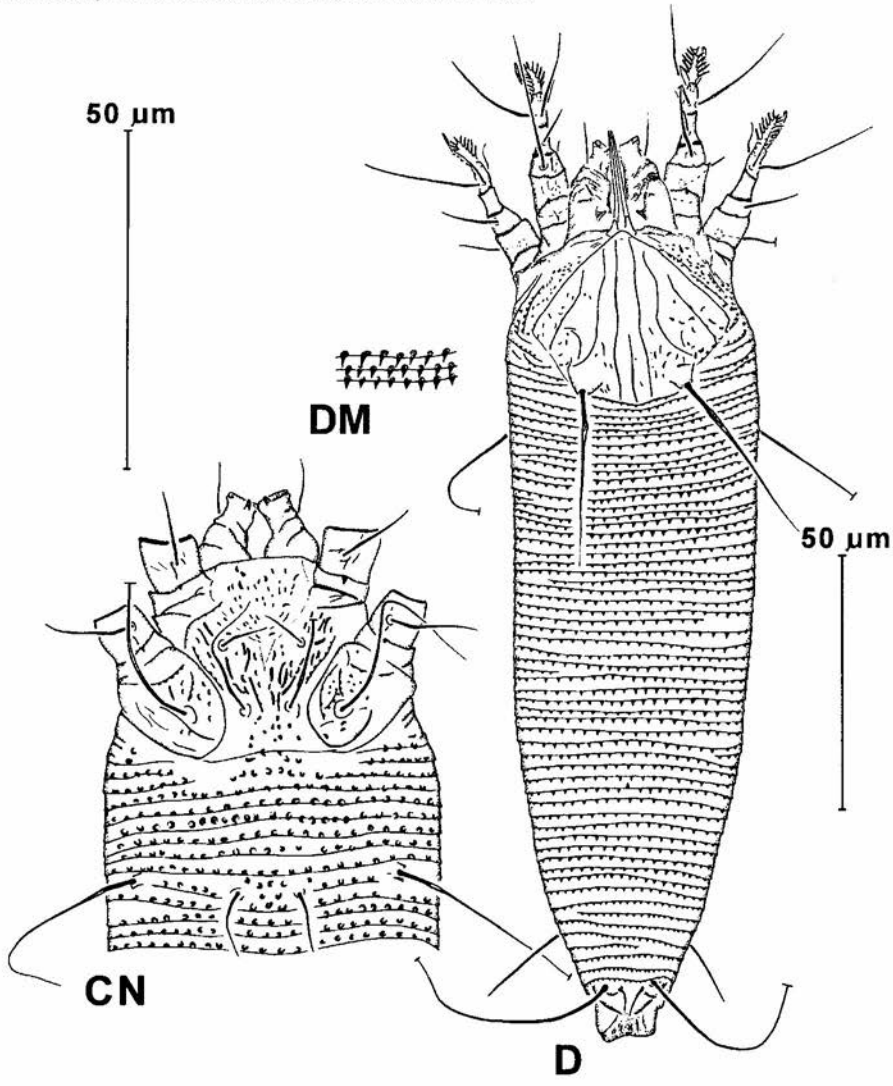



28. *Aceria glomerivagrans* n. sp., female: CG – coxigenital region, PV – ventral telosome

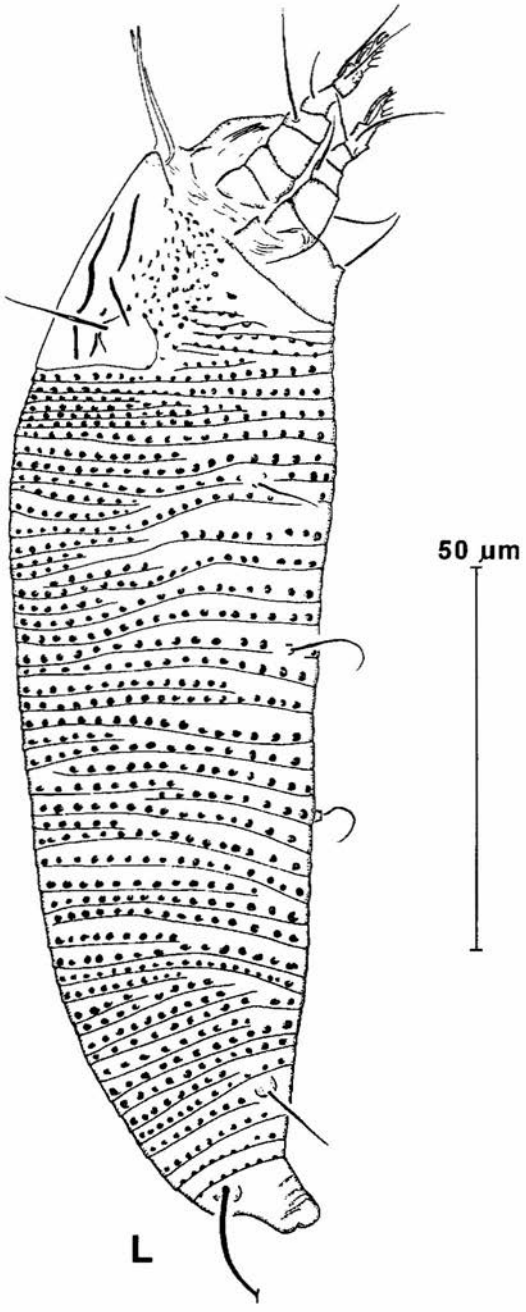



29. *Aceria glomerivagrans* n. sp.: L1, L2 – legs I and II of female, CGM – coxigenital region of male

Prodorsal shield: 40 (35-44) long, 48 (42-50) wide. Triangularly-oval with little lobe reaching the half of cheliceral base. Sculpture: median line on rear 1/2 of shield; admedian complete and parallel to each other; I and II submedian lines complete and sinuous, I submedian lines subparallel to admedian, running lateral just in front of tubercles of setae *sc*; arched transversal lines between I submedian, II submedian lines and lateral margin of shield. Tubercles of setae *sc* on rear margin of shield, setae *sc* 56 (48-62) long, 26 (22-29) apart, projecting to rear. Numerous, slender dashes on surface near shield.




30. *Aceria glomerivagrans* n. sp., nymph: CN – coxisternum and *3a* and *c2* setae, D – dorsal aspect, DM – dorsal microtubercles




31. *Aceria glomerivagrans* n. sp., larva: L – lateral aspect

Coxae: with a pattern of numerous, longitudinal lines. Sternal line marked.

Opisthosoma with 61 (61-77) dorsal annuli, 61 (61-78) ventral annuli, (5-7) coxigenital annuli. Annuli with conical microtubercles: dorsal large, elongated, pointed, set along annuli margins, on telosomal annuli minute; ventral conical, near genital parts rounded, set along annuli margins.

Leg I: (40-48); femur 11 (10-15), seta *bv* 17 (13-22); genu 7 (6-8), seta *l"* 35 (30-40); tibia 9 (9-11), seta *l'* 14 (12-16); tarsus 10 (9-12), setae: *ft"* 29 (28-38); *ft'* 23 (23-30), *u'* 10 (7-13); solenidion *ω* 11 (10-12); empodium 12 (11-14), simple, 8 (7-9)-rayed, symmetrical. Position of setae: *bv* 5 (5-6); *l"* 4 (3-5); *l'* 4 (3-5); *ft"* and *ft'* 4 (3-4); *u'* 7 (5-7).

Leg II: (38-47); femur 11 (10-13), *bv* 22 (17-25); genu 6 (5-8), *l"* 17 (12-19); tibia 8 (7-10); tarsus 10 (8-11), *ft"* 32 (29-36), *ft'* 12 (10-14), *u'* 8 (7-10); solenidion *ω* 11 (10-13); empodium 11 (11-14), 8 (7-9) rayed, symmetrical. Position of setae: *bv* 5 (4-6); *l"* 4 (3-6); *ft"* and *ft'* 3 (3-4); *u'* 6 (5-7).

Genital parts 19 (16-20) long, 26 (24-28) wide, genital coverflap with 9 (7-11) longitudinal ribs.

Length of setae: pedipalpal: *d* 11 (10-13); *v* 2 (2); coxal: *1b* 10 (9-13); *1a* (19-31); *2a* (46-50); opisthosomal: *c2* 48 (48-67); *d* 64 (58-84); *e* 25 (20-43); *f* 31 (26-36); *3a* 21 (17-36); *h1* 8 (8 10); *h2* (61-68).

Distance between tubercles bearing setae: coxal: *1b* 13 (11-14); *1a* 9 (8-10); *2a* 29 (24-30); *1b* and *1a* 11 (10-12); *1a* and *2a* 10 (9-11); opisthosomal: *c2* 53 (45-57); *d* 31 (31-38); *e* 17 (17-21); *f* 21 (17-24); *3a* 18 (16-20); *h1* 6 (6-7); *h2* 10 (10-11); *h1* and *h2* 3 (2-3).

Number of ventral annuli bearing setae: *c2* 8 (7-9); *d* 20 (19-24); *e* 35 (33-44); *f* 57 (57-73), 5 (5) from rear.

Male (n=7): Body vermiform. Body length 214-264; width 54-64. Gnathosoma 23-27 long; chelicerae 20-23 long.

Prodorsal shield: 38-40 long, 42-49 wide. Shape and sculpture similar to that of female. Tubercles of setae *sc* on rear margin of shield, setae *sc* 43 long, 24-28 apart, projecting to rear.

Coxae: with a pattern similar to that of female (Fig. 29).

Opisthosoma with 59-67 dorsal annuli, 62-72 ventral annuli, 4-6 coxigenital annuli. Annuli with microtubercles: dorsal similar to that of female; ventral subrounded or conical, smaller than those in female, set along annuli margins.

Leg I: 38-48; femur 10, seta *bv* 14-16; genu 5-7, seta *l"* 29-31; tibia 8-9, seta *l'* 10-14; tarsus 9-10, setae: *ft"* 24-32; *ft'* 24-29, *u'* 7-8; solenidion *ω* 10-11; empodium 10-12, simple, 7-rayed, symmetrical. Position of setae: *bv* 4-5; *l"* 3-4; *l'* 3-4; *ft"* and *ft'* 3-4; *u'* 6-7.

Leg II: 36-40; femur 10, *bv* 17-21; genu 5-7, *l"* 13-15; tibia 6-7; tarsus 9-10, *ft"* 27-30, *ft'* 10-13, *u'* 6-8; solenidion *ω* 10-11; empodium 11-12, 7-rayed, symmetrical. Position of setae: *bv* 4-5; *l"* 4-5; *ft"* and *ft'* 3; *u'* 6.

Genital parts 17-20 long, 22-26 wide, surface below the eugenital setae with longitudinal lines (Fig. 29).

Length of setae: pedipalpal: *d* 10-11; *v* 2; coxal: *1b* 10-13; *1a* 19-30; *2a* 43; opisthosomal: *c2* 40-48; *d* 53-66; *e* 21-29; *f* 26-30; *3a* 19-31; *h1* 7-8.

Distance between tubercles bearing setae: coxal: *1b* 12-13; *1a* 8-9; *2a* 25-28; *1b* and *1a* 10 11; *1a* and *2a* 9-10; opisthosomal: *c2* 48-65; *d* 31-36; *e* 17-20; *f* 20-24; *3a* 18-20; *h1* 5-6; *h2* 10; *h1* and *h2* 2-3.

Number of ventral annuli bearing setae: *c2* 8-10; *d* 18-22; *e* 33-39; *f* 58-68, 5 from rear.

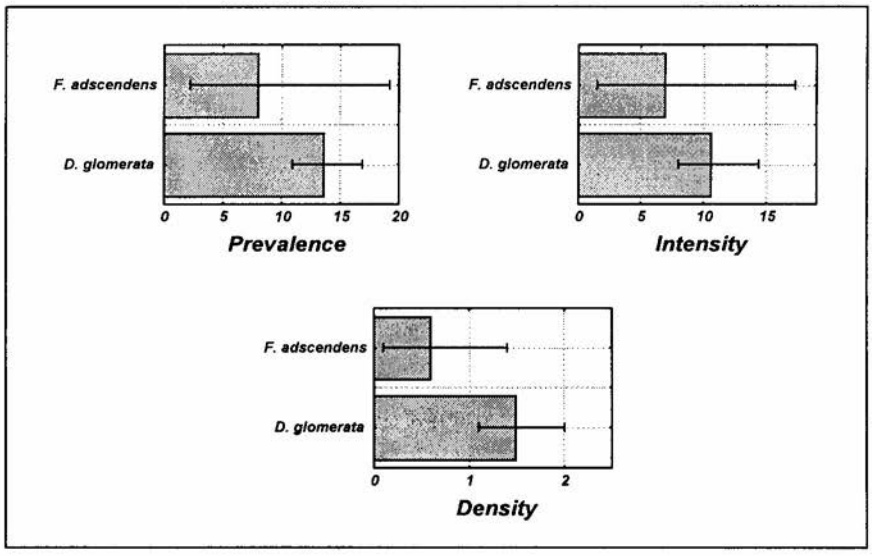
Nymph (n=3) (Fig. 30): Body vermiform. Body length 176-217; width 49-55. Gnathosoma 21-24 long; chelicerae 20-22 long.

Prodorsal shield: 32-37 long, 39-42 wide. Shape and sculpture similar to that of female. Tubercles of setae *sc* on rear margin of shield, setae *sc* 33-40 long, 21-23 apart, projecting to rear.

Coxae: numerous lines and subrounded microtubercles; on I coxae mostly longitudinal lines, on II coxae mostly microtubercles. Sternal line absent.

Opisthosoma with 56-60 dorsal annuli, 56-62 ventral annuli, 9-10 coxigenital annuli. Annuli with microtubercles: dorsal large, conical, pointed, set along annuli margins, on telosomal annuli minute; ventral conical or subrounded, set along annuli margins.

Leg I: 29-35; femur 7-8, seta *bv* 9; genu 4-6, seta *l''* 26-28; tibia 6, seta *l'* 10; tarsus 7-8, setae: *ft''* 24; *ft'* 19, *u'* 7; solenidion *ω* 9; empodium 9-10, simple, 6-rayed, symmetrical. Position of setae: *bv* 4; *l''* 2-4; *l'* 3; *ft''* and *ft'* 2; *u'* 4-5.




32. Prevalence, intensity and density of infestation of *Aceria glomerivagrans* on *Festulolium adscendens* and *Dactylis glomerata*

Leg II: 28-30; femur 8, *bv* 10-15; genu 4-5, *l"* 10-13; tibia 5-6; tarsus 7-8, *ft"* 22-24, *ft'* 6 11; *u'* 5-7; solenidion *ω* 8-9; empodium 9-10, 6-rayed, symmetrical. Position of setae: *bv* 4-5; *l"* 2-3; *ft"* and *ft'* 2-3; *u'* 4-5.

Length of setae: pedipalpal: *d* 9-10; *v* 2; coxal: *1b* 6-13; opisthosomal: *c2* 30-34; *d* 29-31; *e* 16; *f* 17-24; *3a* 10; *h1* 5-7; *h2* 63.

Distance between tubercles bearing setae: coxal: *1b* 11-12; *1a* 7; *2a* 24-26; *1b* and *1a* 10; *1a* and *2a* 8-9; opisthosomal: *c2* 40-45; *d* 25-28; *e* 15; *f* 19-21; *3a* 10; *h1* 5; *h2* 9-10; *h1* and *h2* 2.

Number of ventral annuli bearing setae: *c2* 9; *d* 20-22; *e* 32-37; *f* 52-58, 5 from rear.

Larva (n=1) (Fig. 31): Body vermiform. Body length 162. Gnathosoma 22 long; chelicerae 19 long.

Prodorsal shield: 30 long. Triangular, without anterior lobe. Sculpture: median, admedian and I submedian present. Tubercles of setae *sc* ahead from posterior margin of shield; setae *sc* 13 long, projecting to center of shield.

Opisthosoma with 51 dorsal annuli, 34 ventral annuli, 8 coxigenital annuli. Annuli with subrounded microtubercles, ahead of annuli margins.

Leg I: 26; genu 4, seta *l"* 17; tibia 4, *l'* 6; tarsus 5; solenidion *ω* 6; empodium 7, simple, 5 rayed, symmetrical. Position of setae: *l"* 3; *l'* 2; *ft"* and *ft'* 2.

Leg II: 24; femur 5, *bv* 9; genu 4, *l"* 10; tibia 4; tarsus 5, *ft"* 15, *ft'* 6; solenidion *ω* 7; empodium 8, 5-rayed, symmetrical. Position of setae: *bv* 2; *l"* 2; *ft"* and *ft'* 2.

Length of setae: pedipalpal: *v* 2; opisthosomal: *c2* 11; *d* 10; *e* 7; *f* 12; *3a* 5.

Number of ventral annuli bearing setae: *c2* 6; *d* 12; *e* 18; *f* 31, 4 from rear.

HOST PLANT

*Dactylis glomerata* L. Relation to host plant: vagrant on both leaf surfaces, frequently near the main vein, often in leaf sheaths; no visible damage.

TYPE MATERIAL

female holotype, 75 female paratypes, 21 male paratypes, 9 nymph paratypes, 3 larvae paratypes.

Type locality: Poznań, Lasek Marceliński forest, woodland [PLM01], 19.07.1998, leg. AS.

Table 5

Parameters of infestation of *Aceria glomerivagrans*. For legend see Table 2.

| Host species | *n* | *k* | *P* | *LCI* | *UCI* | *I* | *LCI* | *UCI* | *D* | *LCI* | *UCI* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. *Dactylis glomerata*** | 541 | 74 | 13.7 | 10.9 | 16.9 | 10.7 | 8.0 | 14.4 | 1.5 | 1.1 | 2.0 |
| 2. *Festuca adscendens**** | 50 | 4 | 8.0 | 2.2 | 19.2 | 7.0 | 1.5 | 17.3 | 0.6 | 0.1 | 1.4 |

ETYMOLOGY

The specific designation is derived from the *glomerata* – the specific name of type host plant (*D. glomerata*) and *vagrant* (ang.) – the life style of the new described species.

OTHER RECORDS

*D. glomerata*: [PLM3] - 30.07.1999, (100); 31.08.1999, (60); 23.09.1999, (49); 28.11.1999, (148); 27.12.1999, (36); 22.01.2000, (44); 29.02.2000, (22); [PLM12] - 23.09.1999, (53); 23.10.1999, (41); [PC6] - 30.07.1999, (27); [PC13] - 31.08.1999, (103); 23.09.1999, (44); *Festulolium adscendens*: [SWC1] - 21.05.1999; (28).

ECOLOGICAL NOTES

Specialist I on *Dactylis glomerata*, which is an accessory host. *Festulolium adscendens* is an accidental host (Table 5, Fig. 32)

## *Aceria nardusi* n. sp.

DIAGNOSIS

Female. Typical shape and design of prodorsal shield. Dorsal annuli smooth. 8-rayed empodium.

DESCRIPTION

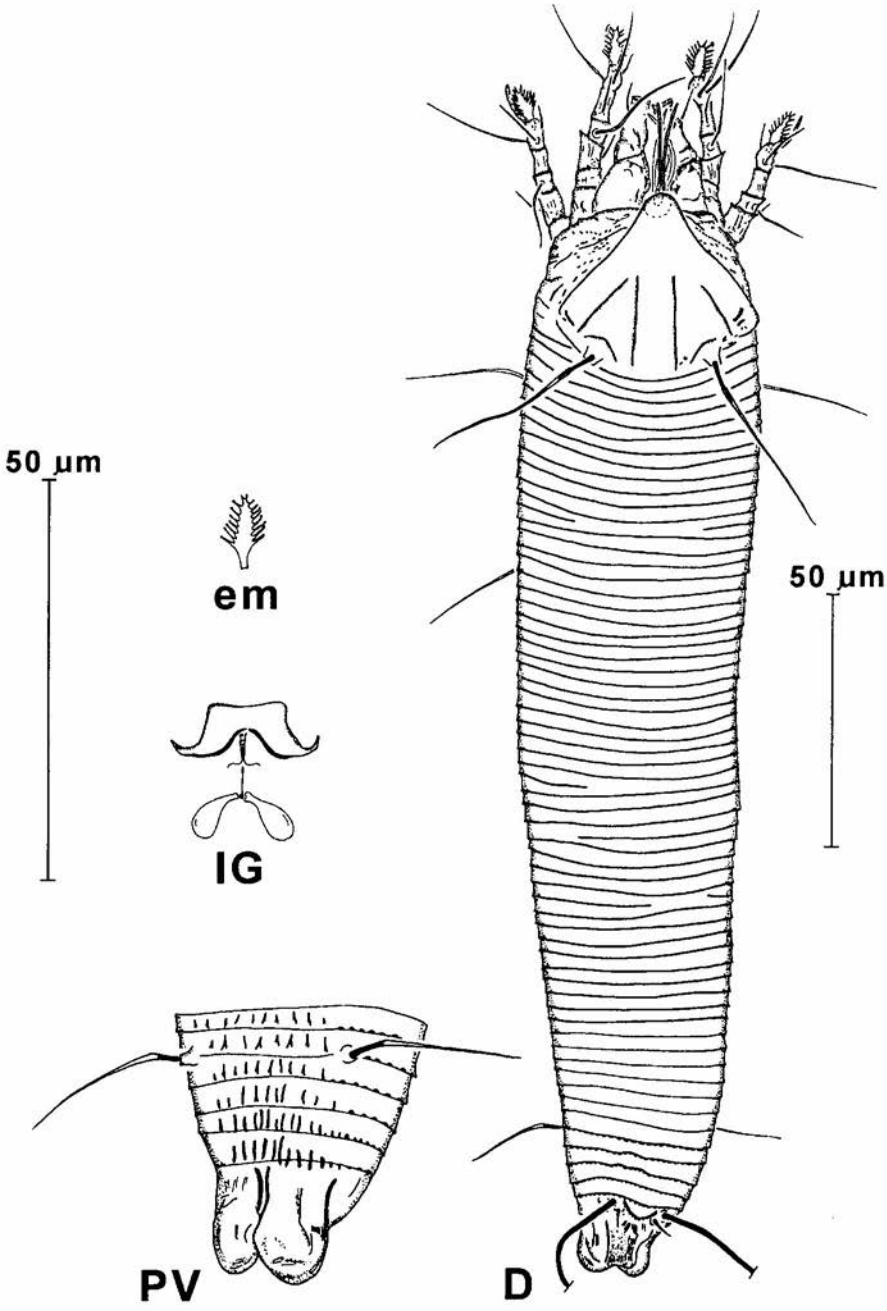
Female (n=10) (Figs 33-34): Body vermiform. Body length 233 (224-286); width 47 (39-50). Gnathosoma 24 (25-30) long; chelicerae 23 (20-24) long.

Prodorsal shield: 38 (36-40) long, 40 (36-39) wide. Triangularly-oval with little, rounded lobe over cheliceral base. Sculpture: median line absent; admedian lines on 1/2 rear half, parallel to each other; submedian lines on 1/2 rear half, parallel to lateral margin of shield; short transversal line over tubercles bearing *sc* setae. Tubercles of setae *sc* on rear margin of shield, setae *sc* 40 (33-38) long, 25 (24-27) apart, projecting to rear. Few subrounded microtubercles or dashes on surface near shield.

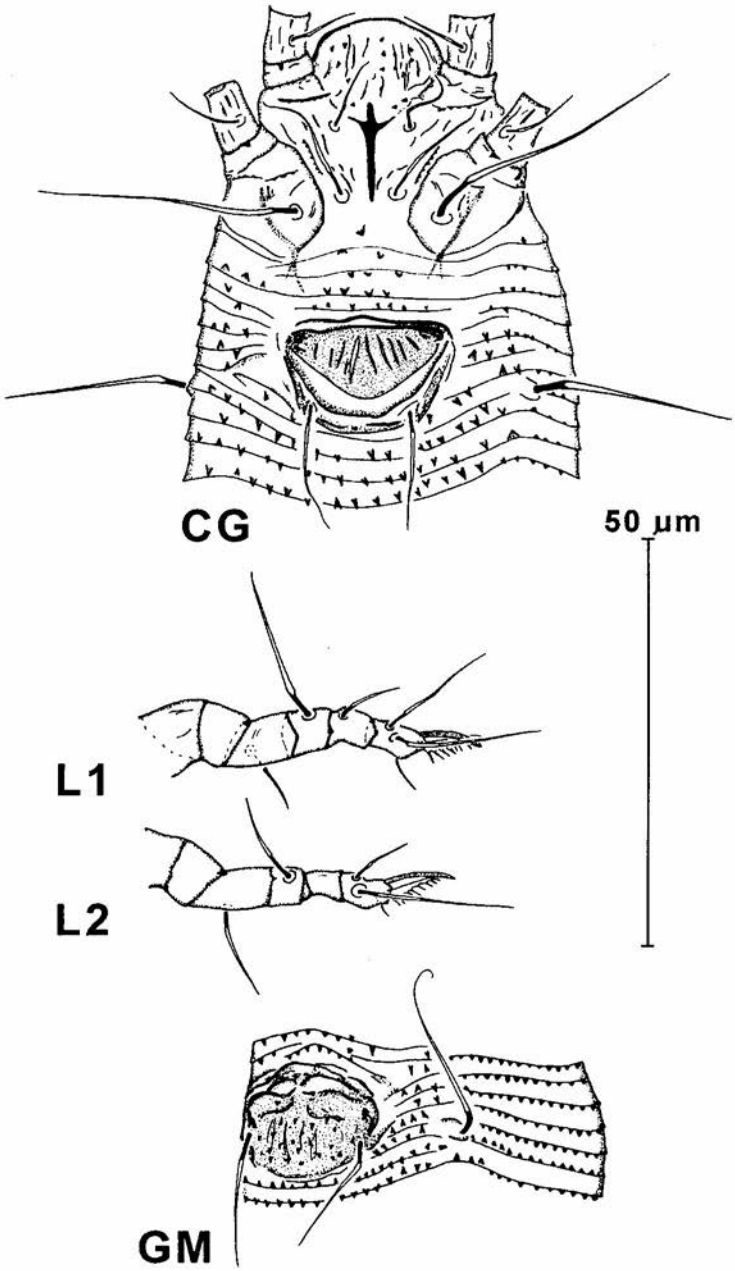
Coxae: with a pattern of few lines and bead-like microtubercles. Sternal line marked.

Opisthosoma with 60 (57-61) dorsal annuli, 63 (56-64) ventral annuli, 4 (4-6) coxigenital annuli. Dorsal annuli smooth, except telosomal on which there are minute and bead-like microtuberlces; ventral conical, pointed, ahead from annuli margins, on telosomal annuli elongated.

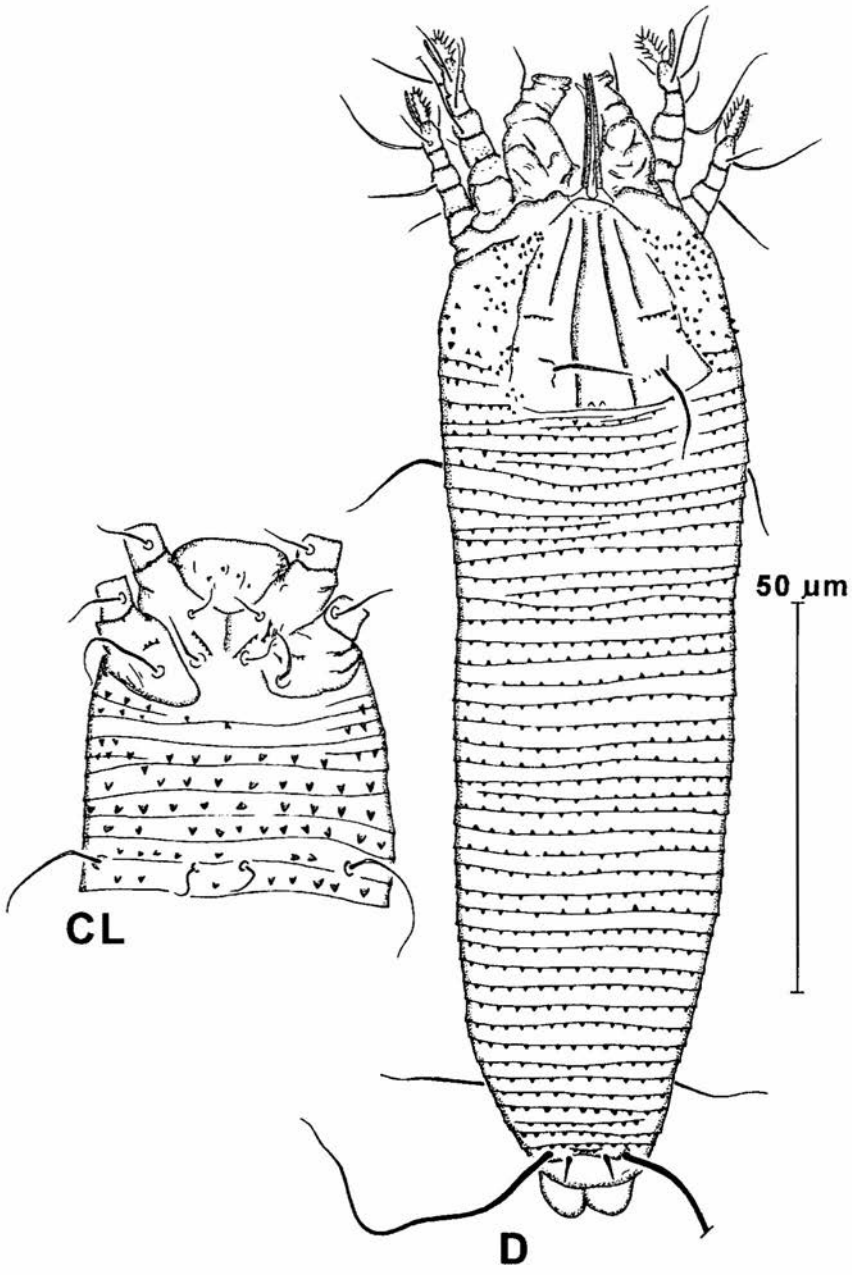
Leg I: 29 (28-34); femur 8 (7-9), seta *bv* 11 (8-12); genu 5 (4-5), seta *l''* 22 (18-23); tibia 7 (6), seta *l'* 8 (8-10); tarsus 6 (6-8), setae: *ft''* 19 (19-23); *ft'* 16 (14-19), *u'* 6 (5-6); solenidion *ω* 8 (7 9); empodium 9 (9-10), simple, 8 (8-9)-rayed, symmetrical. Position of setae: *bv* 4 (3 4); *l''* 3 (2-3); *l'* 3 (2-3); *ft''* and *ft'* 2 (2-3); *u'* 3 (3-5).




33. *Aceria nardusi* n. sp., female: D – dorsal aspect, IG – internal genitalia, PV – ventral telosoma, em - empodium




34. *Aceria nardusi* n. sp.: CG – coxigenital region of female, L1, L2 – legs I and II of female, GM – genital region of male




35. *Aceria nardusi* n. sp., larva: CL – coxisternum and *3a* and *c2* setae, D – dorsal aspect

Leg II: 28 (27-32); femur 9 (7-10), *bv* 11 (9-13); genu 4 (4-5), *l"* 12 (11-13); tibia 5 (5-6); tarsus 7 (6-7), *ft"* 20 (20-23), *ft'* 10 (8-10), *u'* 5 (5-6); solenidion ω9 (8-9); empodium 9 (9-10), 8 (8)-rayed, symmetrical. Position of setae: *bv* 4 (3-4); *l"* 2 (2-3); *ft"* and *ft'* 2 (2); *u'* 4 (3-4).

Genital parts 12 (12-16) long, 21 (19-20) wide, genital coverflap with 9 (8-10) longitudinal ribs.

Length of setae: pedipalpal: *d* 8 (7-9); *v* 2 (2-3); *ep* (4-5); coxal: *1b* 10 (8-10); *1a* (17-23); *2a* 36 (30-35); opisthosomal: *c2* 26 (23-27); *d* 29 (23-27); *e* 13 (11-15); *f* 22 (22-27); *3a* 14 (14-18); *h1* 3 (3-5); *h2* 67 (62-67).

Distance between tubercles bearing setae: coxal: *1b* 10 (8-10); *1a* 8 (6-9); *2a* 18 (16-20); *1b* and *1a* 8 (8-10); *1a* and *2a* 6 (6-8); opisthosomal: *c2* 42 (37-42); *d* 28 (28-31); *e* 15 (14-17); *f* 21 (20-22); *3a* 12 (11-13); *h1* 7 (7-9); *h2* 10 (10-11); *h1* and *h2* 2 (2-3).

Number of ventral annuli bearing setae: *c2* 7 (6-8); *d* 20 (17-21); *e* 36 (32-37); *f* 59 (52-59), 5 (5) from rear.

Male (n=5): Body elongated, more spindleform than that of female. Body length 163-233; width 40. Gnathosoma 26 long; chelicerae 21-23 long.

Prodorsal shield: 35-38 long, 34 wide. Shape and sculpture similar to that of female. Tubercles of setae *sc* on rear margin of shield, setae *sc* 29-34 long, 21-24 apart, projecting to rear.

Coxae: with a pattern similar to that of female.

Opisthosoma with 54-56 dorsal annuli, 56-60 ventral annuli, 5 coxigenital annuli. Annuli with conical microtubercles: dorsal minute, not pointed; ventral larger than dorsal, pointed, set along annuli margins.

Leg I: 27-32; femur 8-9, seta *bv* 10; genu 4-6, seta *l"* 17-21; tibia 6-7, seta *l'* 7-8; tarsus 6-8, setae: *ft"* 18-19; *ft'* 14-16, *u'* 6; solenidion ω 7-9; empodium 9-10, simple, 8-rayed, symmetrical. Position of setae: *bv* 3-4; *l"* 2-3; *l'* 2-3; *ft"* and *ft'* 2-3; *u'* 4-5.

Leg II: 26-32; femur 8-9, *bv* 11-13; genu 4-5, *l"* 11-14; tibia 5-6; tarsus 6-7, *ft"* 21-22, *ft'* 10-11, *u'* 6; solenidion ω 9-10; empodium 9-10, 8-rayed, symmetrical. Position of setae: *bv* 3-4; *l"* 2-3; *ft"* and *ft'* 2-3; *u'* 4-5.

Genital parts 13-15 long, 17-18 wide, surface below the eugenital setae with conical microtubercles (Fig. 34).

Length of setae: pedipalpal: *d* 6-8; *v* 2; coxal: *1b* 7-10; *2a* 35-38; opisthosomal: *c2* 24-32; *d* 28-31; *e* 12-17; *f* 22-24; *3a* 13-16; *h1* 3-4; *h2* 68-71.

Distance between tubercles bearing setae: coxal: *1b* 9-10; *1a* 5-7; *2a* 13-16; *1b* and *1a* 9; *1a* and *2a* 6-7; opisthosomal: *c2* 32; *d* 22-29; *e* 11-14; *f* 18; *3a* 12-15; *h1* 5-6; *h2* 9-10; *h1* and *h2* 2.

Number of ventral annuli bearing setae: *c2* 7-8; *d* 17-18; *e* 28-33; *f* 52-56, 5 from rear.

Nymph not found.

Larva (n=3) (Fig. 35): Body vermiform. Body length 142-159, wide 39-42. Gnathosoma 18-21 long; chelicerae 18-19 long.

Prodorsal shield: 28-32 long, 22-27 wide. Triangular, with little anterior lobe reaching 1/3 base of chelicerae. Sculpture: median line absent; admedian lines complete, from anterior lobe base diverging to rear margin; I submedian lines on anterior 1/2, parallel to admedian. Tubercles of setae *sc* ahead from posterior margin of shield; setae *sc* 11-15 long, 12-16 apart. Conical microtubercles on surface near shield.

Opisthosoma with 41-48 dorsal annuli, 33-35 ventral annuli, 6-7 coxigenital annuli. Annuli with conical microtubercles: dorsal set along annuli margins, on telosomal annuli subrounded; ventral ahead from annuli margins.

Leg I: 23-28; femur 5-7, seta *bv* 6-8; genu 3-4, seta *l"* 15-17; tibia 3-4, seta *l'* 5-7; tarsus 5-6, setae: *ft"* 15-16; *ft'* 12-13, *u'* 5-6; solenidion $\omega$ 6-7; empodium 7, simple, 6-rayed, symmetrical. Position of setae: *bv* 3; *l"* 2; *l'* 2; *ft"* and *ft'* 2; *u'* 3-4.

Leg II: 18-23; femur 5-7, *bv* 10-11; genu 3-4, *l"* 10-11; tibia 3; tarsus 4-6, *ft"* 17-19, *ft'* 6-7, *u'* 5-6; solenidion $\omega$ 6-7; empodium 6-7, 6-rayed, symmetrical. Position of setae: *bv* 2-3; *l"* 2; *ft"* and *ft'* 2; *u'* 3.

Length of setae: pedipalpal: *d* 6; *v* 2; *ep* 3; coxal: *1b* 7-12; *2a* 22; opisthosomal: *c2* 17-22; *d* 24; *e* 8-12; *f* 14-18; *3a* 7; *h1* 3.

Distance between tubercles bearing setae: coxal: *1b* 8-9; *1a* 6-7; *2a* 16-18; *1b* and *1a* 6-7; *1a* and *2a* 6-7; opisthosomal: *c2* 33-35; *d* 19-21; *e* 11-12; *f* 15-16; *3a* 6; *h1* 5; *h2* 8-10; *h1* and *h2* 2.

Number of ventral annuli bearing setae: *c2* 7-8; *d* 13-14; *e* 17-19; *f* 30-32, 4-5 from rear.

HOST PLANT

*Nardus stricta* L. Relation to host plant: vagrant on upper leaf surfaces, leaf blades discoloration.

TYPE MATERAL

Female holotype, 49 female paratypes, 17 male paratypes, 9 nymph paratypes.

Type locality: Beskid Sądecki Mts, Przechyba, 1173 asl., meadow [BSP1], 28.08.1999, leg. AS.

ETYMOLOGY

The specific designation is derived from the generic name of type host plant – *Nardus*.

ECOLOGICAL NOTES

Specialist I on *N. stricta*, which is a specific host. The values of mites infestation ($n$=5; $k$=4): $P$=80.0% (*Cl:* 28.4%-99.5%); $I$=24.3 (*Cl*: 8.8-40.5); $D$=19.4 (*Cl*: 7.0-32.4) specimens per shoot.

### *Aceria stipaespinulata* n. sp.

DIAGNOSIS

Female. Typical shape and design of prodorsal shield. Small, pointed lobe over cheliceral base with a little thorn. Surface near prodorsal shield smooth. Dorsal microtubercles subrounded. Empodium 8-rayed.

DESCRIPTION

Female (n=9) (Figs 36-38): Body vermiform. Body length 196 (174-252); width 46 (37-45). Gnathosoma 23 (17-24) long; chelicerae 21 (18-22) long.

Prodorsal shield: 36 (34-38) long, 36 (33-40) wide. Triangular, small and pointed lobe over cheliceral base with little thorn. Sculpture: lines on rear half; median line very short and split; admedian lines very short and with median line forming "M"; submedian lines arched, on 1/3 rear part, parallel to lateral margin of shield; transverse, forming obtuse angle, short lines over tubercles bearing *sc* setae. Tubercles of setae *sc* on rear margin of shield, setae *sc* 31 (32-34) long, 24 (19-25) apart, projecting to rear. Surface near shield smooth.

Coxae: with a pattern of lines: on I coxae longitudinal, on II coxae round about tubercles of setae *2a*. Sternal line slender.

Opisthosoma with 58 (57-63) dorsal annuli, 55 (55-66) ventral annuli, 5 (4-6) coxigenital annuli. Annuli with microtubercles: dorsal subrounded, set along annuli margins, on telosomal annuli minute; ventral conical, pointed, on telosomal annuli elongated.

Leg I: 33 (29-33); femur 9 (8-10), seta *bv* 11 (8-14); genu 5 (5-6), seta *l"* 23 (19-23); tibia 6 (6-7), seta *l'* 9 (7-10); tarsus 7 (6-8), setae: *ft"* 23 (19-26); *ft'* 19 (16-20), *u'* 5 (4-7); solenidion *ω* 7 (7-8); empodium 9 (9-10), simple, 8 (7-8)-rayed, symmetrical. Position of setae: *bv* 4 (4); *l"* 3 (3); *l'* 2 (2-4); *ft"* and *ft'* 2 (2-3); *u'* 5 (4-6).

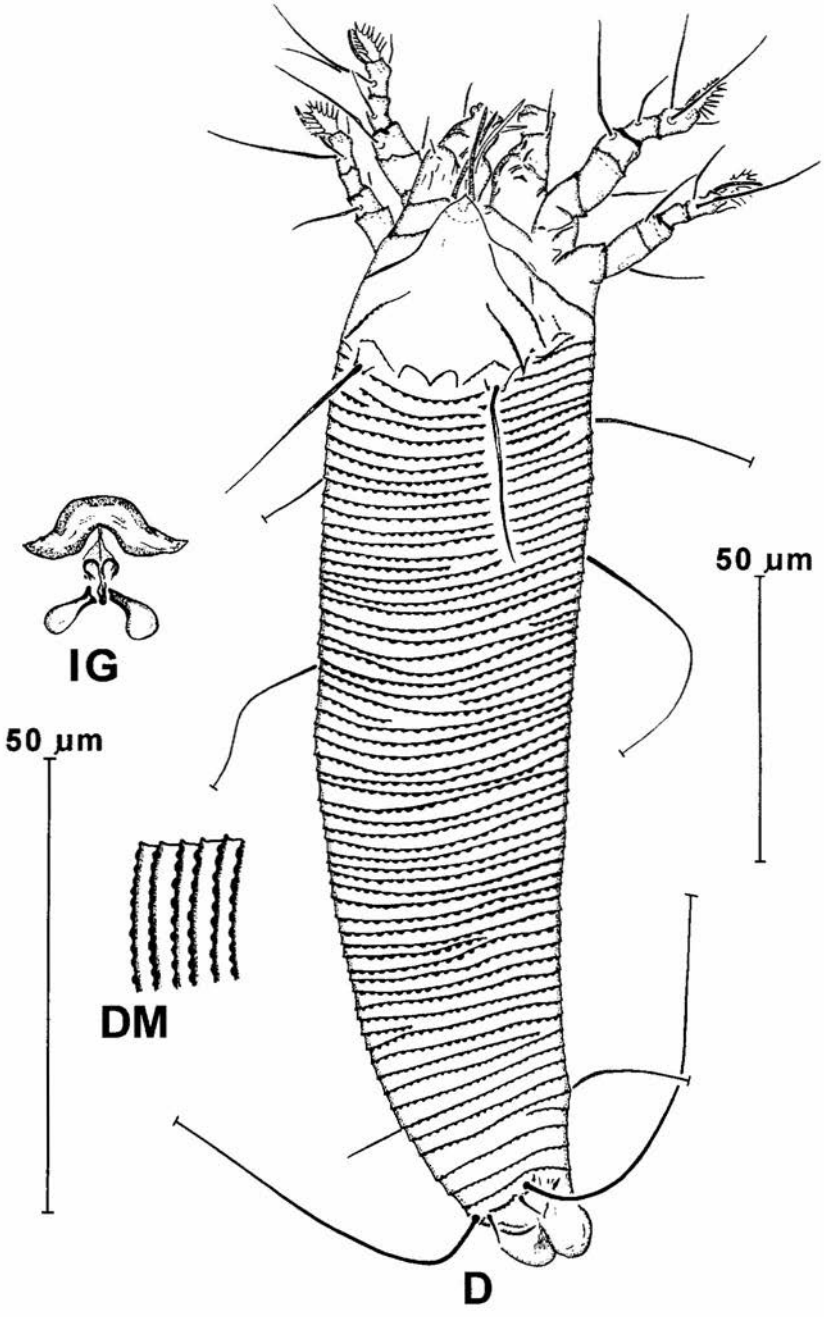
Leg II: 29 (27-30); femur 9 (9-10), *bv* 15 (11-16); genu 4 (4-5), *l"* 14 (11-14); tibia 5 (5-6); tarsus 7 (6-8), *ft"* 24 (17-26), *ft'* 10 (10-11), *u'* 6 (5-7); solenidion *ω* 8 (7-9); empodium 9 (9-10), 8 (7-8)-rayed, symmetrical. Position of setae: *bv* 4 (4); *l"* 2 (2-3); *ft"* and *ft'* 2 (2-3); *u'* 4 (4-6).

Genital parts 14 (11-14) long, 19 (16-20) wide, genital coverflap with 7 (7-10) longitudinal ribs.

Length of setae: pedipalpal: *d* 7 (7-10); *v* 3 (2); *ep* 4 (3-4); coxal: *1b* 10 (8-11); *1a* 18 (16-25); *2a* 49 (46-48); opisthosomal: *c2* 30 (27-33); *d* 60 (48-66); *e* 50 (36-50); *f* 23 (18-29); *3a* 19 (16-22); *h1* 4 (3-4); *h2* 73 (62-90).

Distance between tubercles bearing setae: coxal: *1b* 10 (10); *1a* 7 (5-7); *2a* 19 (16-20); *1b* and *1a* 8 (7-8); *1a* and *2a* 7 (6-8); opisthosomal: *c2* 36 (32-33); *d* 25 (23-27); *e* 14 (11-14); *f* 18 (16-18); *3a* 11 (11-13); *h1* 7 (6-9); *h2* 11 (10-11); *h1* and *h2* 2 (2).

Number of ventral annuli bearing setae: *c2* 7 (6-8); *d* 16 (14-19); *e* 30 (29-37); *f* 51 (51-62), 5 (5) from rear.



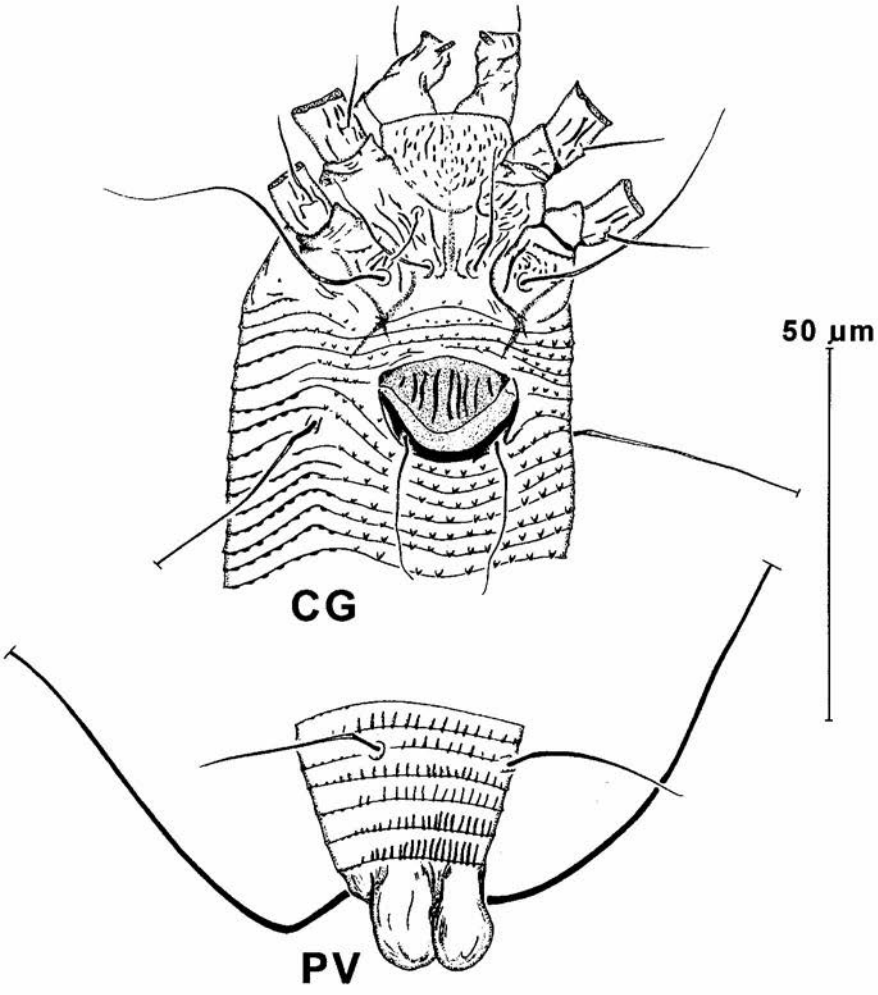

36. *Aceria stipaespinulata* n. sp., female: D – dorsal aspect, DM – dorsal microtubercles, IG – internal genitalia

Male (n=9). Body elongated. Body length 175-202; width 37-40. Gnathosoma 22-23 long; chelicerae 19-22 long.

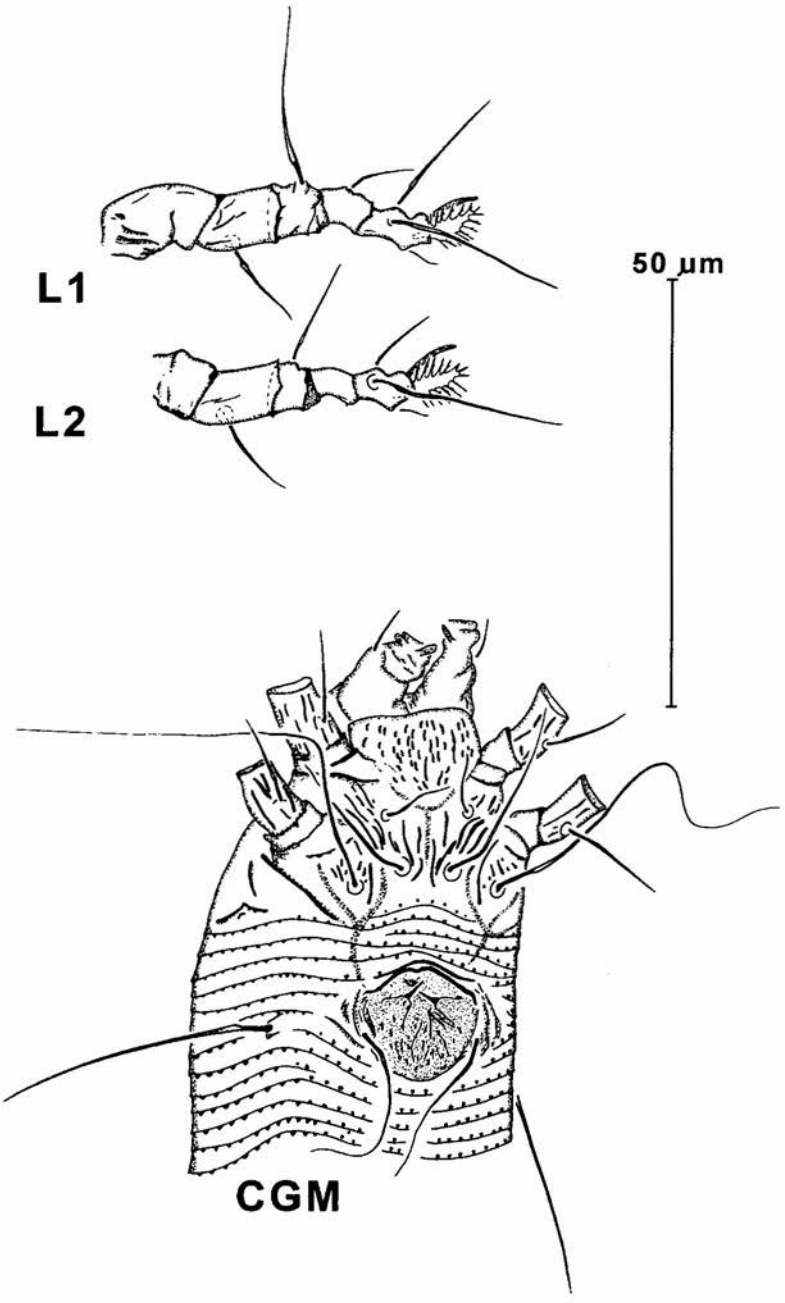
Prodorsal shield: 30-35 long, 36 wide. Shape and sculpture similar to that of female. Tubercles of setae *sc* on rear margin of shield, setae *sc* 27-32 long, 20-22 apart, projecting to rear.

Coxae: with a pattern similar to that of female (Fig. 38).

Opisthosoma with 51-55 dorsal annuli, 52-57 ventral annuli, 4-6 coxigenital annuli. Annuli with microtubercles: dorsal similar to that of female; ventral minute, bead-like, set along annuli margins, on telosomal annuli elongated.

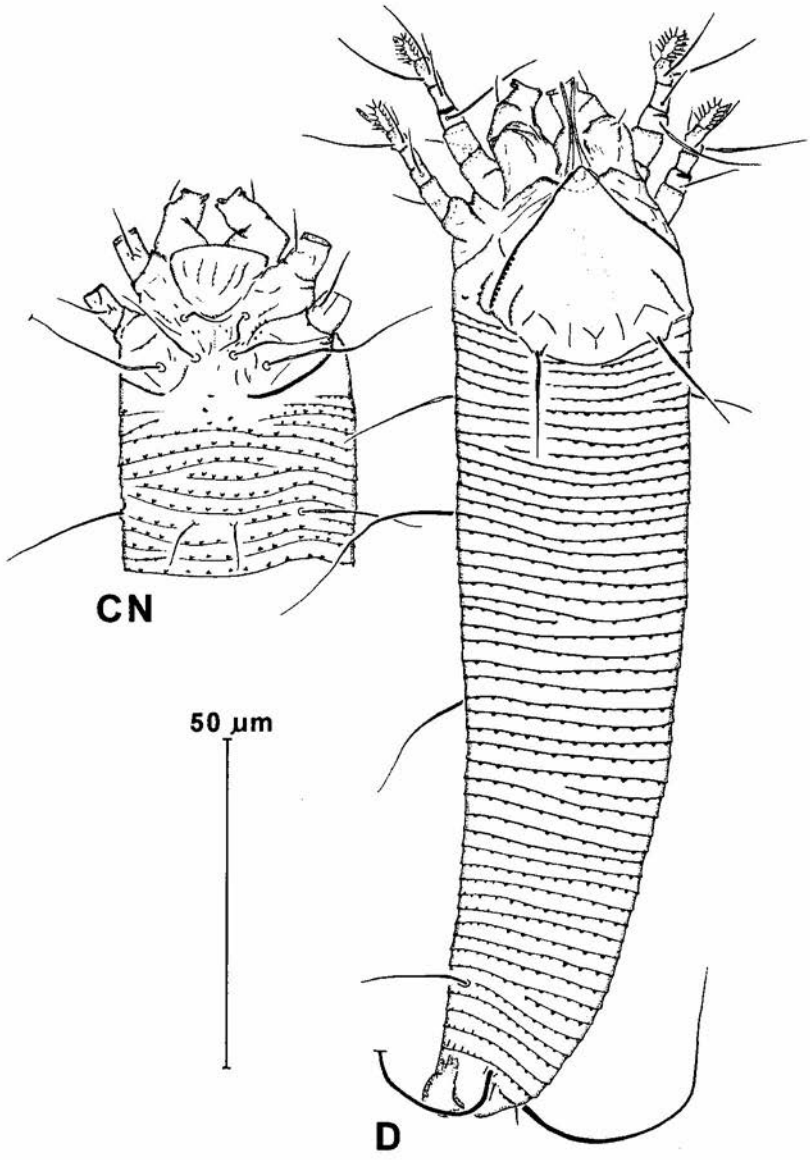



37. *Aceria stipaespinulata* n. sp., female: CG – coxigenital region, PV – ventral telosome




38. *Aceria stipaespinulata* n. sp.: L1, L2 – legs I and II of female, CGM – coxigenital region of male

Leg I: 28-32; femur 8-10, seta *bv* 9-12; genu 5, seta *l"* 18-22; tibia 6-7, seta *l'* 8-9; tarsus 6-8, setae: *ft"* 19-21; *ft'* 15-17, *u'* 5-7; solenidion *ω* 7-8; empodium 7-10, simple, 6-7-rayed, symmetrical. Position of setae: *bv* 4; *l"* 2-3; *l'* 3-4; *ft"* and *ft'* 2-3; *u'* 4-5.




39. *Aceria stipaespinulata* n. sp., nymph: CN - coxisternum and *3a* and *c2* setae, D – dorsal aspect

Leg II: 27-29; femur 8-10, *bv* 10-15; genu 4-5, *l"* 11-14; tibia 4-6; tarsus 6-7, *ft"* 19-22, *ft'* 9-10, *u'* 5-6; solenidion *ω* 8-9; empodium 7-9, 6-7-rayed, symmetrical. Position of setae: *bv* 4; *l"* 2-3; *ft"* and *ft'* 2-3; *u'* 4-5.

Genital parts 13-16 long, 16-18 wide, surface below the eugenital setae with minute microtubercles (Fig. 38).

Length of setae: pedipalpal: *d* 6-8; *v* 2-3; *ep* 3-4 coxal: *1b* 10; *1 a* 19-23; *2a* 33-43; opisthosomal: *c2* 28-32; *d* 46-62; *e* 30-48; *f* 19-26; *3a* 17-19; *h1* 3-5; *h2* 57-86.

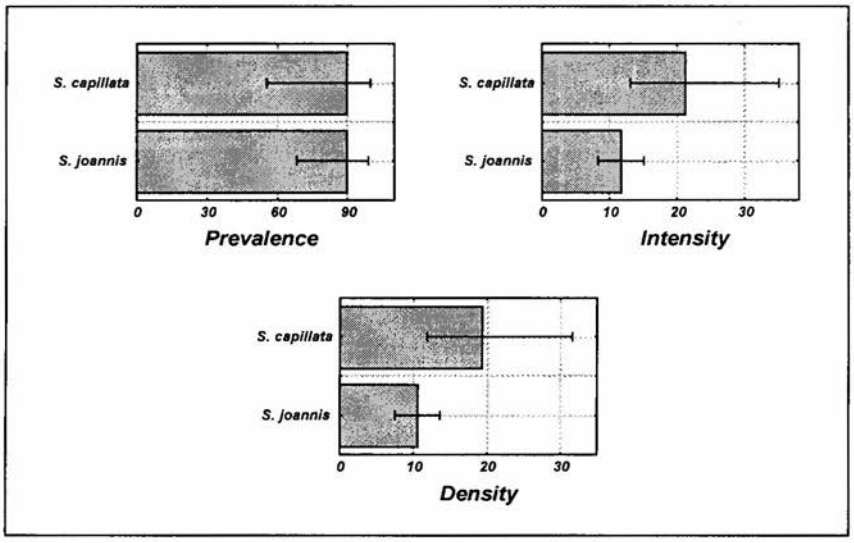
Distance between tubercles bearing setae: coxal: *1b* 9-10; *1a* 6; *2a* 16-18; *1b* and *1a* 7-8; *1a* and *2a* 6-7; opisthosomal: *c2* 30-34; *d* 21-24; *e* 10; *f* 12-15; *3a* 11-14; *h1* 6-7; *h2* 10; *h1* and *h2* 2.

Number of ventral annuli bearing setae: *c2* 6-7; *d* 13-15; *e* 26-31; *f* 48-53, 5 from rear.

Nymph (n=7) (Fig. 39): Body vermiform. Body length 128-183, wide 35-38. Gnathosoma 17-21 long; chelicerae 18-20 long.

Prodorsal shield: 29-31 long, 30-33 wide. Triangular, with little pointed anterior lobe over cheliceral base. Sculpture: median line similar to that of female; admedian lines on rear 1/6 part; submedian and transversal lines similar to that of female. Tubercles of setae *sc* on rear margin; setae *sc* 18-24 long, 17-21 apart, projecting to rear. Surface near prodorsal shield smooth.

Opisthosoma with 47-51 dorsal annuli, 46-51 ventral annuli, 6-8 coxigenital annuli. Annuli with conical microtubercles: dorsal not pointed, set along annuli margins, on telosomal annuli minute; ventral pointed, set along annuli margins.




40. Prevalence, intensity and density of infestation of *Aceria stipaespinulata* on two *Stipa* species

Leg I: 21-27; femur 6-8, seta *bv* 8-11; genu 3-5, seta *l"* 16-21; tibia 4-6, seta *l'* 5-8; tarsus 4-6, setae: *ft"* 16-18; *ft'* 11-14, *u'* 4-6; solenidion *ω* 5-7; empodium 7-8, simple, 6-rayed, symmetrical. Position of setae: *bv* 2-4; *l"* 2-3; *l'* 2-3; *ft"* and *ft'* 2; *u'* 2-4.

Leg II: 20-23; femur 6-7, *bv* 8-10; genu 3, *l"* 10-11; tibia 3-4; tarsus 4-6, *ft"* 16-22, *ft'* 7-9, *u'* 4-5; solenidion *ω* 6-7; empodium 7-8, 5-6-rayed, symmetrical. Position of setae: *bv* 2-3; *l"* 2; *ft"* and *ft'* 2; *u'* 3.

Length of setae: pedipalpal: *d* 5-7; *v* 2; *ep* 3-4; coxal: *1b* 6-7; *1a* 16-24; *2a* 29-33; opisthosomal: *c2* 18-26; *d* 27-38; *e* 24-32; *f* 17-21; *3a* 8-12; *h1* 3; *h2* 57.

Distance between tubercles bearing setae: coxal: *1b* 9-10; *1a* 5-7; *2a* 15-17; *1b* and *1a* 7; *1a* and *2a* 5-6; opisthosomal: *c2* 25-29; *d* 19-21; *e* 10-12; *f* 14-17; *3a* 6-7; *h1* 5-6; *h2* 8-10; *h1* and *h2* 2.

Number of ventral annuli bearing setae: *c2* 5-8; *d* 14-18; *e* 25-29; *f* 43-47, 4-5 from rear.

Larva not found

HOST PLANT

*Stipa joannis* CELAK. Relation to host plant: vagrant on upper leaf surfaces, no visible damages.

TYPE MATERIAL

Female holotype, 39 female paratypes, 21 male paratypes, 16 nymph paratypes.

Type locality: Owczary, Pamięcin, xerothermic sward [OW1], 07.09.2000, leg. AS.

ETYMOLOGY

The specific designation is derived from the *Stipa* – the generic name of type host plant and *spînula* (latin) – small, acute thorn, presented on the anterior lobe of prodorsal shield.

OTHER RECORDS

*Stipa capillata*: [OW1] – 18.09.2000, (122); [OW2] - 07.09.2000, (135); 26.04.2001, (76).

Table 6

Parameters of infestation of *Aceria stipaespinulata*. For legend see Table 2.

| Host species | n | k | P | LCI | UCI | I | LCI | UCI | D | LCI | UCI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. *Stipa joannis** | 10 | 18 | 90.0 | 68.3 | 98.9 | 11.7 | 8.3 | 15.1 | 10.6 | 7.5 | 13.6 |
| 2. *Stipa capillata** | 20 | 9 | 90.0 | 55.5 | 99.8 | 21.4 | 13.1 | 35.1 | 19.3 | 11.8 | 31.6 |

ECOLOGICAL NOTES

Specialist II on *Stipa joannis* and *S. capillata*, which both are specific hosts (Table 6, Fig. 40).

### *Aceria taurica* MITROFANOV et SHARONOV, 1988

DESCRIPTION

Female (n=6) (Figs 41-42): Body vermiform. Body length 351-361; width 90. Gnathosoma 30 long; chelicerae 30 long.

Prodorsal shield: 37-40 long, 45 wide. Triangularly-oval, without anterior lobe over cheliceral base. Sculpture: median line complete; admedian lines complete, from anterior lobe base diverging to rear margin; I submedian lines wavy, on 2/3 anterior part, subparallel to admedian; numerous dashes and short lines between submedian lines and lateral margin of shield and between admedian lines and tubercles bearing *sc* setae. Posterior margin of shield slender. Tubercles of setae *sc* on rear margin of shield, setae *sc* 32-40 long, 33-34 apart, projecting to rear. Dashes and subrounded microtubercles present on surface near shield.

Coxae: with a pattern of numerous linies and dashes. Sternal line present.

Opisthosoma with 81-86 dorsal annuli, 80-88 ventral annuli, 7-8 coxigenital annuli. Annuli with conical and not pointed microtubercles, set on annuli margins: dorsal larger than ventral.

Leg I: 42-45; femur 11, seta *bv* 14; genu 6, seta *l"* 26-29; tibia 9, seta *l'* 10-11; tarsus 9, setae: *ft"* 27; *ft'* 20, *u'* 7; solenidion $\omega$ 10, knobbed; empodium 9, simple, 6-rayed, symmetrical. Position of setae: *bv* 4-5; *l"* 3; *l'* 3; *ft"* and *ft'* 2; *u'* 5-6.

Leg II: 35-37; femur 10-11, *bv* 10; genu 5-6, *l"* 13-15; tibia 7; tarsus 8-9, *ft"* 29-30, *ft'* 8 10, *u'* 5-6; solenidion $\omega$ 10-11, knobbed; empodium 8, 6-rayed, symmetrical. Position of setae: *bv* 4; *l"* 3; *ft"* and *ft'* 2-3; *u'* 5.

Genital parts 15 long, 29-30 wide, genital coverflap with 14-15 longitudinal ribs.

Length of setae: pedipalpal: *d* 8; *v* 2; coxal: *1b* 12; *1a* 25-27; *2a* 45-47; opisthosomal: *c2* 20-24; *d* 46-58; *e* 15-17; *f* 20; *h1* 5; *3a* 20-24. Seate *f* stout.

Distance between tubercles bearing setae: coxal: *1b* 16-17; *1a* 15-16; *2a* 31-35; *1b* and *1a* 8-9; *1a* and *2a* 10; opisthosomal: *c2* 85-95; *d* 60-70; *e* 30-31; *f* 24-25; *3a* 28-31; *h1* 12-17; *h2* 17-20; *h1* and *h2* 3-4.

Number of ventral annuli bearing setae: *c2* 12-13; *d* 28-30; *e* 45-48; *f* 75-83, 5-6 from rear.

Male, nymph and larva not found

HOST PLANT

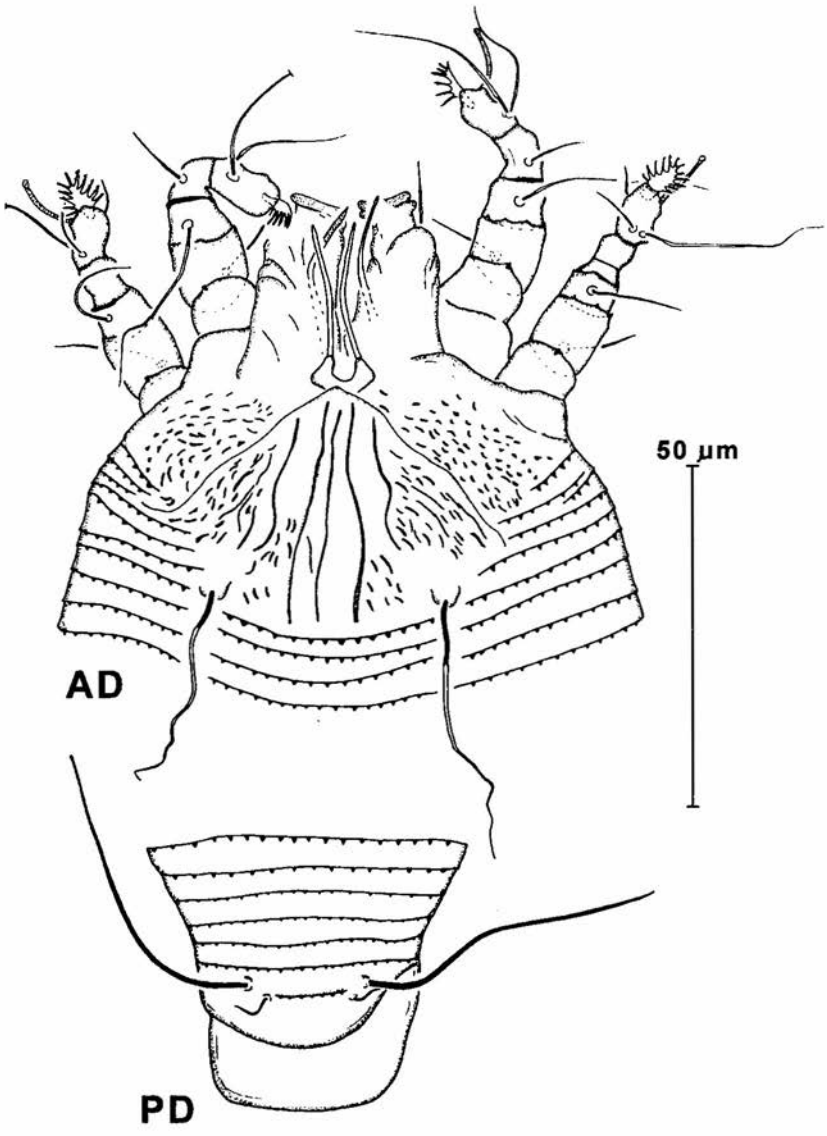
*Holcus lanatus* L. Relation to host plant: vagrant on the upper leaf surface, no visible damage.

MATERIAL

24 females from Modła near Głogów, meadow [MOG1], 26.07.1998, leg. AS.

REMARKS

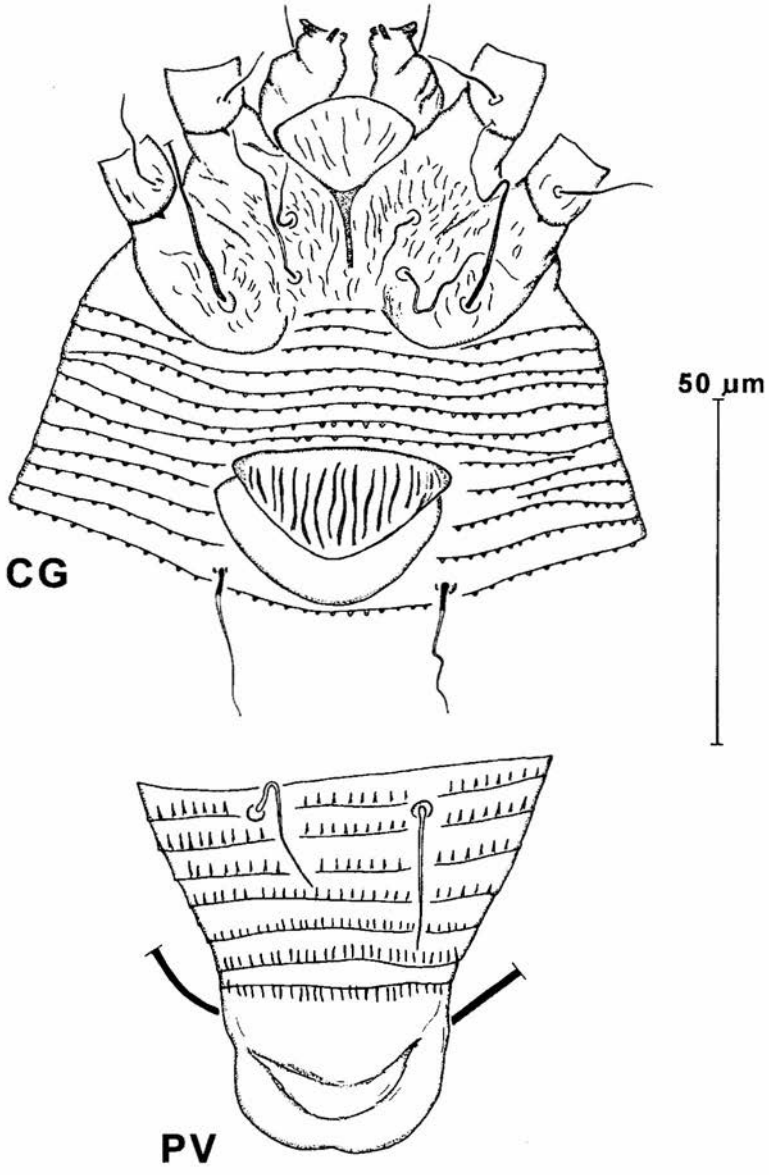
*A. taurica* is new for the Polish fauna.




41. *Aceria taurica* MITROFANOV et SHARONOV, female: AD – antero-dorsal aspect, PD – dorsal telosome

ECOLOGICAL NOTES

Species found only on *H. lanatus*, which is an accidental host. The values of mites infestation ($n$=56; $k$=1): $P$=1.8% (*Cl:* 0.1%-9.6%); $D$=0.2 (*Cl*: 0.0-0.5) specimens per shoot.




42. *Aceria taurica* MITROFANOV et SHARONOV, female: CG – coxigenital region, PV – ventral telosome

GENERAL DISTRIBUTION

Palearctic Region. The species so far was recorded in Krymskaya Region, Ukraine on undetermined grass (MITROFANOV et al. 1988).

## *Aceria tenuis* (NALEPA, 1891)

*Phytoptus tenuis* NALEPA, 1891
*Eriophyes tenuis* (NALEPA, 1891)

REMARKS

Species recorded in Poland from *Agropyron repens*, *Brachypodium pinnatum*, *Bromus inermis* (BOCZEK 1969; BOCZEK et al. 1976). Originally described from *Bromus hordaceus* in Germany (NALEPA 1891). Species recorded also in Bulgaria, Finland, France, Hungary, Italy, Sweden, Russia and Yugoslavia from more than 60 species of grasses. Mites live in leaf sheaths, leaf rolling margins, in heads on inner surface of flower scales (AMRINE & STASNY 1994).

## *Aceria tosichella* KEIFER, 1969

*Eriophyes tulipae* KEIFER, 1938
*Aceria tulipae* (KEIFER, 1938)
*Aceria tritici* SHEVTCHENKO et al., 1970

DESCRIPTION

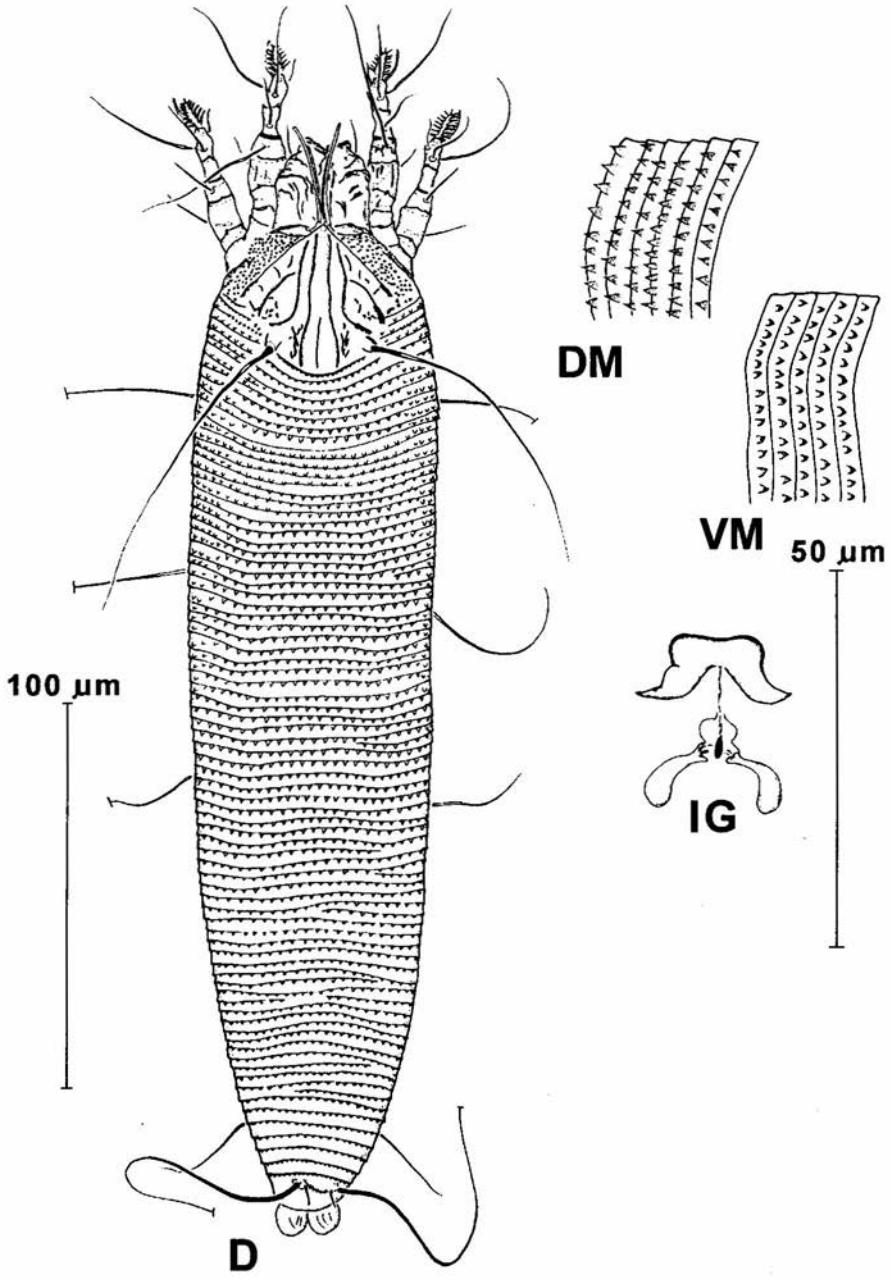
Female (n=10) (Figs 43-45): Body vermiform. Body length 237-289; width 56-64. Gnathosoma 24-27 long; chelicerae 20-23 long.

Prodorsal shield: 41-44 long, 40-45 wide. Anterior half triangular, posterior half semicircular. Little lobe over the 1/2 of base of chelicerae. Sculpture: median line on rear half; admedian lines complete, sinusoid, parallel to each other; I submedian lines subparallel to admedian on 2/3 rear part, then running lateral just in front of tubercles of setae *sc*; II submedian lines on rear part, arched, with I submedian lines forming oval figures. Tubercles of setae *sc* on rear margin of shield, setae *sc* 70-96 long, 24-27 apart, projecting to rear. Conical microtubercles present on surface near shield.

Coxae: with a pattern of lines, spots and microtubercles. Sternal line distinct.

Opisthosoma with 61-66 dorsal annuli, 62-68 ventral annuli, 5-7 coxigenital annuli. Annuli with conical microtubercles: dorsal pointed, set along annuli margins; ventral not pointed, set ahead from annuli margins on telosomal annuli elongated.

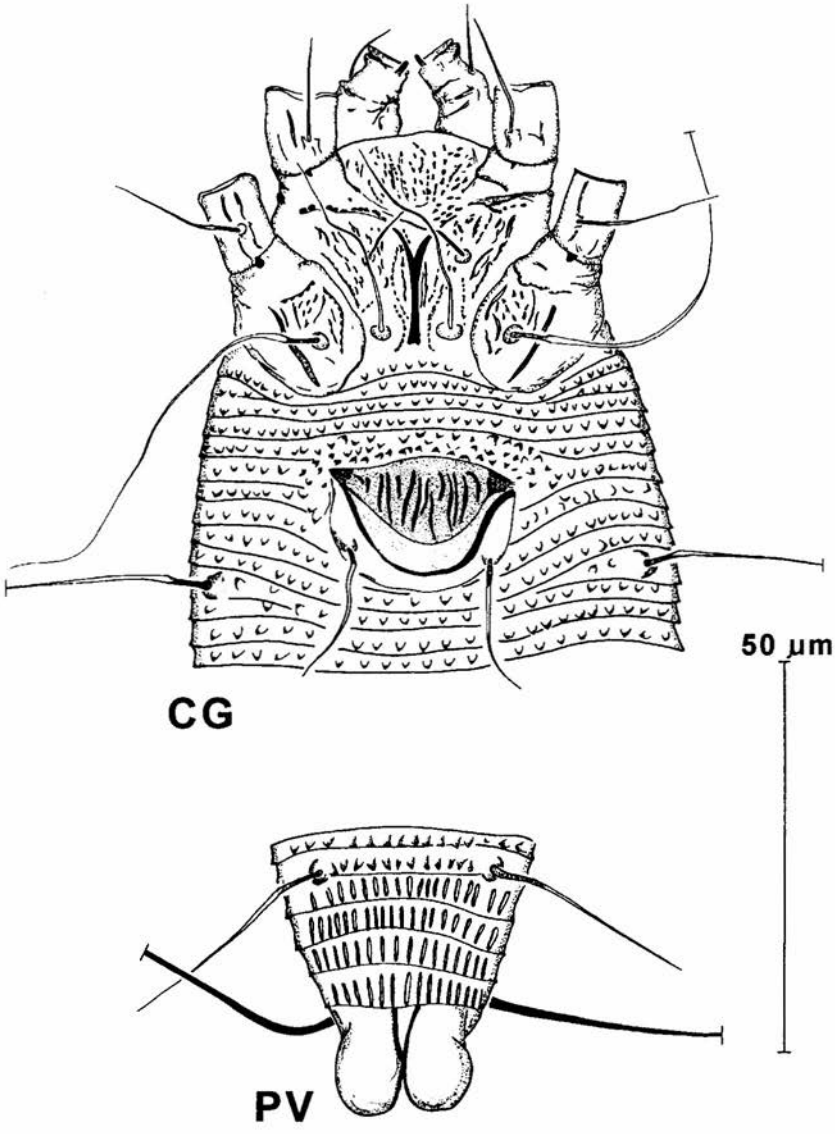
Leg I: 38-44; femur 10-12, seta *bv* 14-20; genu 6-7, seta *l''* 30-34; tibia 9-10, seta *l'* 11-16; tarsus 9-10, setae: *ft''* 25-36; *ft'* 18-29, *u'* 7-10; solenidion $\omega$ 10-11; empodium 10-12, simple, 7-8-rayed, symmetrical. Position of setae: *bv* 4-6; *l''* 3-5; *l'* 3-5; *ft''* and *ft'* 3-4; *u'* 5-6.




43. *Aceria tosichella* KEIFER, female: D – dorsal aspect, DM – dorsal microtubercles, IG – internal genitalia, VM – ventral microtubercles

Leg II: 35-43; femur 10-12, *bv* 17-21; genu 5-6, *l''* 14-19; tibia 7-8; tarsus 9-10, *ft''* 27-36, *ft'* 10-12, *u'* 6-8; solenidion *ω* 10-12; empodium 10-12, 7-8-rayed, symmetrical. Position of setae: *bv* 5-6; *l''* 3-4; *ft''* and *ft'* 3; *u'* 5-6.

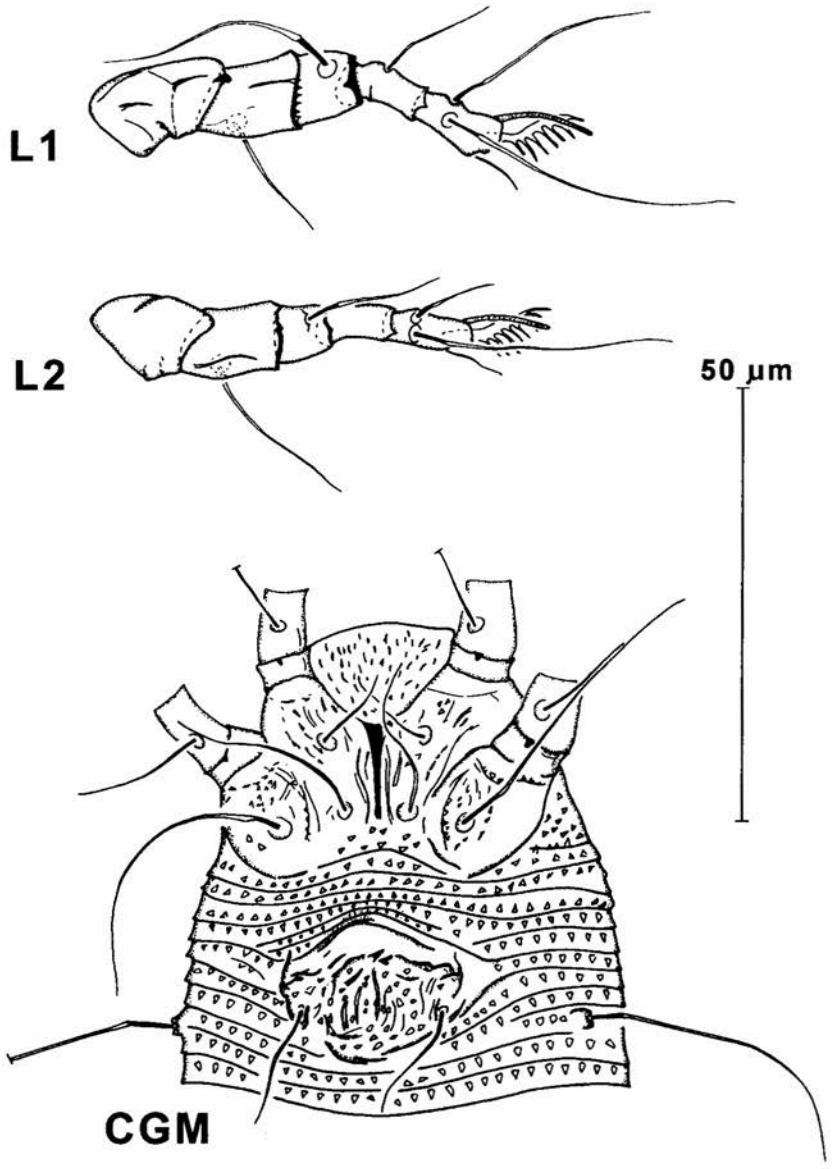
Genital parts 16-19 long, 23-25 wide, genital coverflap with 8-13 longitudinal ribs.



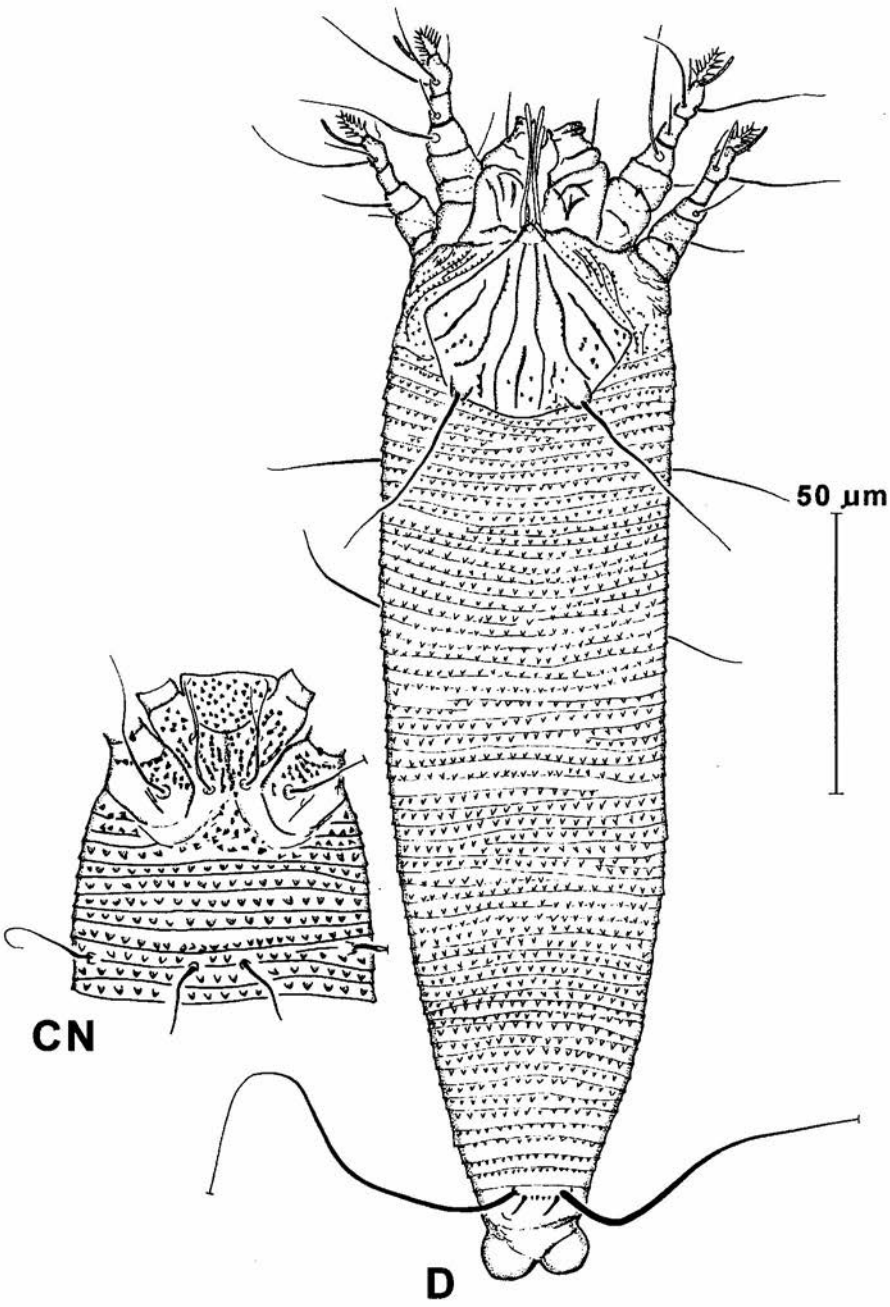

44. *Aceria tosichella* KEIFER, female: CG – coxigenital region, PV – ventral telosome

Length of setae: pedipalpal: *d* 10-12; *v* 2; *ep* 4; coxal: *1b* 9-14; *1a* 17-30; *2a* 38-56; opisthosomal: *c2* 46-53; *d* 57-64; *e* 38-52; *f* 29-35; *h1* 5-7; *h2* 81-112; *3a* 19-25.

Distance between tubercles bearing setae: coxal: *1b* 12-14; *1a* 8-10; *2a* 24-29; *1b* and *1a* 9-11; *1a* and *2a* 9-10; opisthosomal: *c2* 52-57; *d* 33-43; *e* 19-24; *f* 20-27; *3a* 17-19; *h1* 5-7; *h2* 10-11; *h1* and *h2* 2-3.




45. *Aceria tosichella* KEIFER: L1, L2 – legs I and II of female, CGM – coxigenital region of male




46. *Aceria tosichella* KEIFER, nymph: CN - coxisternum and *3a* and *c2* setae, D – dorsal aspect

Number of ventral annuli bearing setae: *c2* 7-10; *d* 19-22; *e* 34-39; *f* 50-64, 5 from rear.

Male (n=5): Body vermiform. Body length 201-231; width 48-53. Gnathosoma 21-25 long; chelicerae 19-21 long.

Prodorsal shield: 36-42 long, 38-41 wide. Shape and sculpture similar to that of female. Tubercles of setae *sc* on rear margin of shield, setae *sc* 46-52 long, 22-25 apart, projecting to rear.

Coxae: with a pattern similar to that of female (Fig. 45).

Opisthosoma with 55-58 dorsal annuli, 58-61 ventral annuli, 4-6 coxigenital annuli. Annuli with microtubercles similar to that of female.

Leg I: 33-37; femur 10, seta *bv* 11-13; genu 5-6, seta *l"* 24-30; tibia 7-8, seta *l'* 8-11; tarsus 8-10, setae: *ft"* 25-27; *ft'* 17-21, *u'* 6-8; solenidion $\omega$ 10; empodium 9-10, simple, 6-7–rayed, symmetrical. Position of setae: *bv* 4-5; *l"* 3; *l'* 3; *ft"* and *ft'* 2-3; *u'* 5.

Leg II: 32-35; femur 9-10, *bv* 14-18; genu 5, *l"* 13-19; tibia 6-7; tarsus 8-9, *ft"* 22-30, *ft'* 10-11, *u'* 7; solenidion $\omega$ 10-11; empodium 9-10, 6-rayed, symmetrical. Position of setae: *bv* 3-5; *l"* 3; *ft"* and *ft'* 2-3; *u'* 4-6.

Genital parts 16-19 long, 19-22 wide, surface below the eugenital setae with conical microtubercles (Fig. 45).

Length of setae: pedipalpal: *d* 9-10; *v* 2; *ep* 4; coxal: *1b* 10-12; *1a* 18-24; *2a* 42-48; opisthosomal: *c2* 38-43; *d* 47-48; *e* 38-43; *f* 27-32; *3a* 14-21; *h1* 4-5, *h2* 67-76.

Distance between tubercles bearing setae: coxal: *1b* 11-12; *1a* 7-8; *2a* 21-25; *1b* and *1a* 9; *1a* and *2a* 8-9; opisthosomal: *c2* 43-49; *d* 29-30; *e* 16-18; *f* 18-22; *3a* 16-17; *h1* 5-6; *h2* 9-10; *h1* and *h2* 2-3.

Number of ventral annuli bearing setae: *c2* 7-8; *d* 17-18; *e* 31-33; *f* 54-57, 5 from rear.

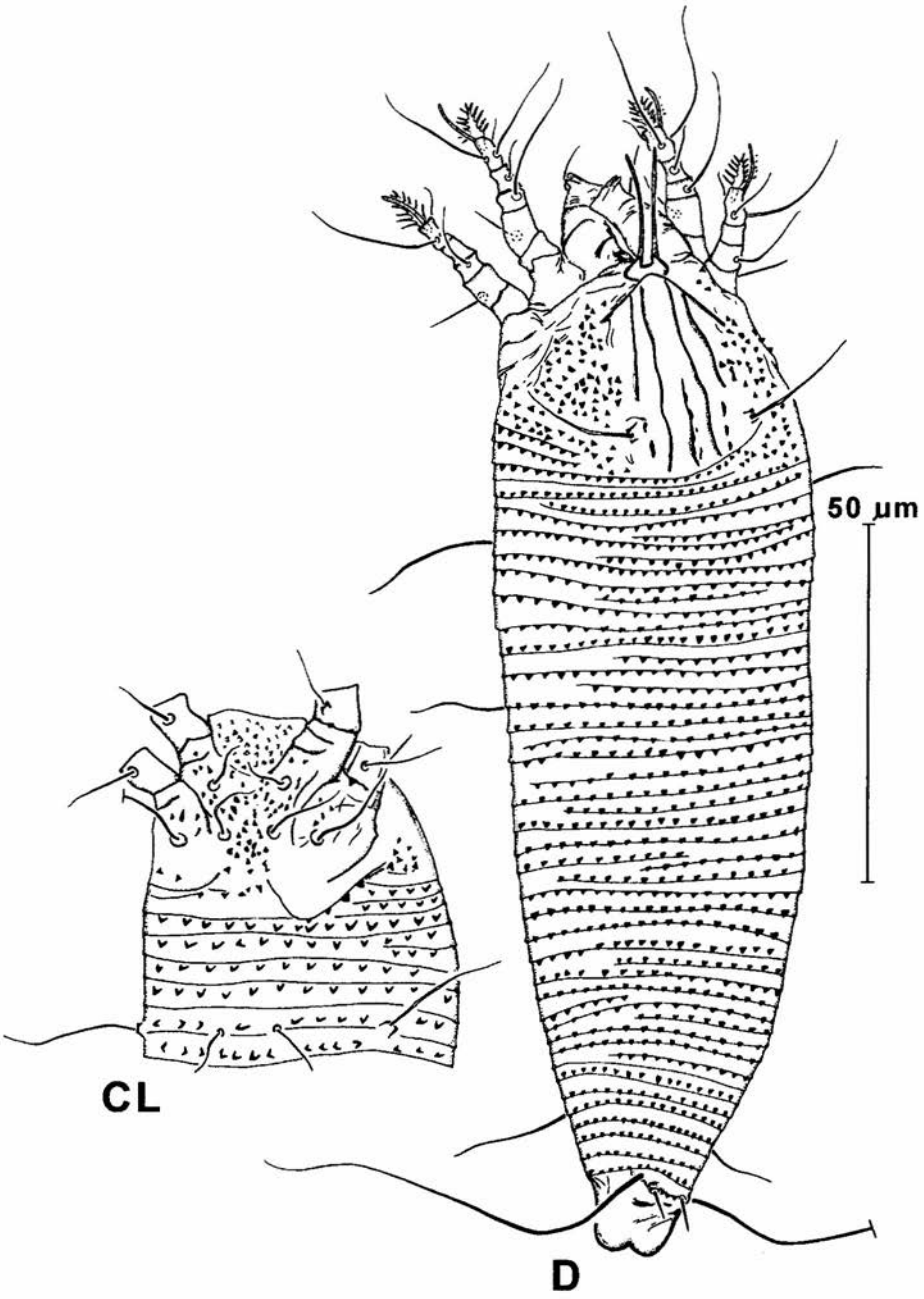
Nymph (n=4) (Fig. 46): Body vermiform. Body length 195-282; width 49-51. Gnathosoma 19-22 long; chelicerae 19 long.

Prodorsal shield: 38-39 long, 38-42 wide. Shape and sculpture: similar to that of female, except II submedian lines that are straight, not arched. Tubercles of setae *sc* on rear margin of shield, setae *sc* 43-47 long, 22 apart, projecting to rear. Surface near shield with conical microtubercles.

Coxae: with pattern of numerous microtubercles and few lines. Sternal line slender.

Opisthosoma with 54-56 dorsal annuli, 52-56 ventral annuli, 9-11 coxigenital annuli. Annuli with microtubercles: similar to that of female.

Leg I: 31-37; femur 8-9, seta *bv* 10-11; genu 4-5, seta *l"* 24-26; tibia 6-7, seta *l'* 7-9; tarsus 6-7, setae: *ft"* 16-24; *ft'* 15-21, *u'* 6-7; solenidion $\omega$ 8-10; empodium 9-10, simple, 6-7–rayed, symmetrical. Position of setae: *bv* 4; *l"* 3; *l'* 2-3; *ft"* and *ft'* 2-3; *u'* 4-5.




47. *Aceria tosichella* KEIFER, larva: CL – coxisternum and *3a* and *c2* setae, D – dorsal aspect

Leg II: 28-30; femur 8-9, *bv* 11-14; genu 4-5, *l"* 13-14; tibia 5-6; tarsus 7, *ft"* 21-25; *ft'* 10-12, *u'* 6-7; solenidion *ω* 8-10; empodium 7-10, 6-rayed, symmetrical. Position of setae: *bv* 4; *l"* 2-3; *ft"* and *ft'* 2; *u'* 4.

Length of setae: pedipalpal: *d* 8-10; *v* 2; *ep* 4; coxal: *1b* 10; *1a* 11-15; *2a* 30; opisthosomal: *c2* 27-34; *d* 29-48; *e* 19; *f* 19-27; *3a* 8-11; *h1* 3-4; *h2* 48.

Distance between tubercles bearing setae: coxal: *1b* 11-12; *1a* 8-9; *2a* 22-24; *1b* and *1a* 9-10; *1a* and *2a* 7-8; opisthosomal: *c2* 45-47; *d* 30-33; *e* 15-17; *f* 21-23; *3a* 9-10; *h1* 5; *h2* 9-10; *h1* and *h2* 2-3.

Number of ventral annuli bearing setae: *c2* 8-9; *d* 18-20; *e* 31-33; *f* 48-52, 5 from rear.

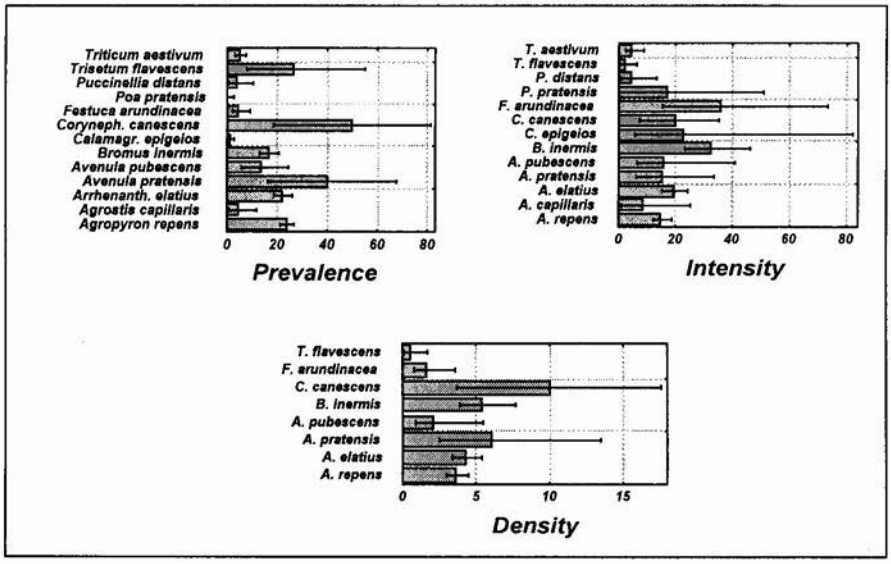
Larva (n=1) (Fig. 47): Body vermiform. Body length 143. Gnathosoma 18.

Prodorsal shield: 33 long. Triangular, with slender lateral margins. Sculpture: median and admedian lines similar to that of female; I submedian lines on anterior half, parallel to admedian; II submedian lines absent. Tubercles of setae *sc* ahead from posterior margin of shield, setae *sc* 24. Conical microtubercles present on surface near shield

Coxae: conical microtubercles. Sternal line absent.

Opisthosoma with 53 dorsal annuli, 32 ventral annuli. Annuli with conical, not pointed microtubercles.

Leg I: 20; femur 7; genu 4, seta *l"* 19; tibia 5, seta *l'* 7; tarsus 5, setae: *ft"* 19; *ft'* 14, *u'* 5; solenidion *ω* 6; empodium 7, simple, 6-rayed, symmetrical. Position of setae: *bv* 3; *l"* 3; *l'* 3; *ft"* and *ft'* 2; *u'* 5.




48. Prevalence, intensity and density of infestation of *Aceria tosichella* on grass species. Explanation of abbreviations: "*Coryneph.*" – *Corynephorus*, "*Calamagr.*" – *Calamagrostis*, "*Arrhenath.*" – *Arrhenantherum*

Leg II: 21; femur 9, *bv* 10; genu 4; tibia 4; tarsus 6, *ft"* 16, *u'* 4; solenidion *ω* 7; empodium 7, 6-rayed, symmetrical. Position of setae: *l"* 2; *ft"* and *ft'* 2; *u'* 3.

Length of setae: pedipalpal: *d* 6; *v* 2; coxal: *1a* 14; *2a* 29; opisthosomal: *c2* 14; *d* 22; *e* 14; *f* 15; *3a* 9; *h1* 5.

Distance between tubercles bearing setae: opisthosomal: *d* 21; *e* 13; *3a* 7; *h1* and *h2* 3.

Number of ventral annuli bearing setae: *c2* 6; *d* 12; *e* 18; *f* 29, 4 from rear.

HOST PLANT

*Arrhenantherum elatius* (L.) P. BEAUV. ex J.

Relation to host plant: vagrant on the upper leaf surface, mostly in young, rolled leaves, rarely in leaf sheats and flowers; no visible damage.

MATERIAL

230 females, 92 males, 56 nymphs, 16 larvae from Poznań, Cytadela park, scarp with south exposition [PC13], 30.10.1999, leg. AS.

Other records: *Agropyron repens*: [ZAD1] - 04.08.1998, (44); [PC4] - 25.02.1999, (40); [PC13] - 23.05.1999, (120); 31.08.1999, (50); [PLM10] - 30.07.1999, (256); 23.10.1999, (68); 28.11.1999, (71); 27.12.1999, (152); 22.01.2000, (17); 29.03.2000, (9); [CHK1] - 01.06.2000, (30), leg. AS&WM; 16.06.2000, (322), leg. AS&WM; 02.07.2000, (91), leg. AS&WM; 01.06.2001, (252), leg. AS&WM; 15.06.2001, (148), leg. AS&WM; 01.07.2001, (198), leg. AS&WM; 13.07.2001, (139), leg. AS&WM; 01.08.2001, (26), leg. AS&WM; 18.08.2001, (72), AS&WM; 14.07.2000, (105), leg. ASz; 31.07.2000, (118), leg. ASz; 19.08.2000, (69), leg. ASz; [CHK2] - 01.06.2001, (4), leg. AS&WM; 15.06.2001, (2), leg. AS&WM; 15.06.2001, (7), leg. AS&WM; 01.07.2001, (17), leg. AS&WM; 01.07.2001, (5), leg. AS&WM; 13.07.2001, (39), leg. AS&WM; 13.07.2001, (29), leg. AS&WM; 01.08.2001, (225), leg. AS&WM; 01.08.2001, (94), leg. AS&WM ; 18.08.2001, (43), leg. AS&WM; 18.08.2001, (46), leg. AS&WM; [SWC1] - 16.06.2000, (9), leg. AS&WM; [SWC2] - 01.06.2001, (68), leg. AS&WM; 15.06.2001, (172), leg. AS&WM; 01.07.2001, (80), leg. AS&WM; 13.07.2001, (50), leg. AS&WM; 01.08.2001, (10), leg. AS&MW; *Agrostis capillaris*: [PBP2] - 12.08.1998, (25); *Arrhenantherum elatius*: [PC9] - 13.04.1999, (20); 30.10.1999, (236); 28.11.1999, (320); 27.12.1999, (99); 29.01.2000, (120); 28.02.2000, (41); [PC13] - 20.06.1999, (57); 30.07.1999, (278); 23.09.1999, (56); 28.11.1999, (181); 27.12.1999, (139); 28.02.2000, (58); 29.03.1999, (39); [PC13a] - 31.08.1999, (38); [PC16] - 29.03.2000, (17); [PLM1] - 30.04.1999, (35); *Avenula pratensis*: [PBP3] - 16.10.1999; (64), leg. TR; [PLM1] - 23.10.1999; (28); *A. pubescens*: [PC13] - 28.11.1999, (81); 29.01.2000, (29); 29.03.2000, (18); *Bromus inermis*: [PLM12] - 30.04.1999, (5); 30.07.1999, (50); 31.08.1999, (553); 23.09.1999, (174); 23.10.1999, (586); 28.11.1999, (52); 22.01.2000, (193); 29.02.2000, (63); 29.03.2000, (89); [PLM10] - 20.06.1999, (22); [PC6] - 31.08.1999, (63); [PC13] - 31.08.1999, (159); 23.09.1999, (88); 27.12.1999,

(28); [PBP3] - 16.10.1999, (48), leg. TR; [OW2] - 07.09.2000, (5); *Calamagrostis epigeios*: [PWH] - 24.08.1999, (113); *Corynephorus canescens*: [PBP3] - 16.10.1999, (100), leg. TR; *Festuca arundinacea*: [PLM12] - 30.07.1999, (157); [BIA1] - 01.05.2000, (131); *Poa pratensis*: [PLM3] - 25.10.1998, (34); *Puccinellia distans*: [IN2] - 16.05.2000, (14), leg. ML; *Trisetum flavescens*: [OW2] - 26.04.2001, (9); *Triticum aestivum*: [ZAD2] - 04.08.1998, (12); [SWC1] - 01.06.2000, (10), leg. AS&WM; 02.07.2000, (6), leg. AS&WM; 13.07.2001, (6), leg. AS&WM; [CHK2] - 01.06.2001, (27), leg. AS&WM; 15.06.2001, (21), leg. AS&WM; 01.07.2001, (2), leg. AS&WM; 13.07.2001, (10), leg. AS&WM.

ECOLOGICAL NOTES

Generalist. Two grass species: *Corynephorus canescens* and *Avenula pratensis* are specific hosts, five grass species are accessory hosts, six grass species are accidental host (Table 7; Fig. 48).

Table 7

Parameters of infestation of *Aceria tosichella*. For legend see Table 2.

| Host species | *n* | *k* | *P* | *LCI* | *UCI* | *I* | *LCI* | *UCI* | *D* | *LCI* | *UCI* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. *Agropyron repens*** | 885 | 212 | 24.0 | 21.2 | 26.9 | 15.1 | 12.3 | 18.8 | 3.6 | 3.0 | 4.5 |
| 2. *Agrostis capillaris**** | 70 | 3 | 4.3 | 0.9 | 12.0 | 8.3 | 1.0 | 25.3 | 0.4 | 0.0 | 1.1 |
| 3. *Arrhenantherum elatius*** | 496 | 110 | 22.2 | 18.6 | 26.1 | 19.4 | 15.3 | 24.4 | 4.3 | 3.4 | 5.4 |
| 4. *Avenula pratensis** | 15 | 6 | 40.0 | 16.3 | 67.7 | 15.3 | 6.2 | 33.7 | 6.1 | 2.5 | 13.5 |
| 5. *Avenula pubescens*** | 60 | 8 | 13.3 | 5.9 | 24.6 | 16.0 | 6.6 | 40.9 | 2.1 | 0.9 | 5.5 |
| 6. *Bromus inermis*** | 401 | 67 | 16.7 | 13.2 | 20.7 | 32.5 | 23.4 | 46.3 | 5.4 | 3.9 | 7.7 |
| 7. *Calamagrostis epigeios***** | 397 | 5 | 1.3 | 0.4 | 2.9 | 22.6 | 5.8 | 82.2 | 0.3 | 0.1 | 1.0 |
| 8. *Corynephorus canescens** | 10 | 5 | 50.0 | 18.7 | 81.3 | 20.0 | 7.4 | 35.2 | 10.0 | 3.7 | 17.6 |
| 9. *Festuca arundinacea*** | 165 | 8 | 4.8 | 2.1 | 9.3 | 36.0 | 15.5 | 73.5 | 1.7 | 0.8 | 3.6 |
| 10. *Poa pratensis***** | 265 | 2 | 0.8 | 0.1 | 2.7 | 17.0 | 0.0 | 51.0 | 0.1 | 0.0 | 0.4 |
| 11. *Puccinellia distans***** | 81 | 3 | 3.7 | 0.8 | 10.4 | 4.7 | 0.7 | 13.3 | 0.2 | 0.0 | 0.5 |
| 12. *Trisetum flavescens***** | 15 | 4 | 26.7 | 7.8 | 55.1 | 2.3 | 0.5 | 6.3 | 0.6 | 0.1 | 1.7 |
| 13. *Triticum aestivum***** | 420 | 21 | 5.0 | 3.1 | 7.5 | 4.5 | 2.4 | 8.8 | 0.2 | 0.1 | 0.4 |

GENERAL DISTRIBUTION

Holarctic Region. The species found for the first time in Zemun-Belgrad, Yugoslavia on *Triticum aestivum* L. (KEIFER 1969). Besides, it was recorded in Asia, Australia, Europe, North America from at least 26 grass species (AMRINE & STASNY 1994). In Poland it was previously recorded in the Wielkopolska region and near Inowrocław (JEŻEWSKA & WIECZOREK, 1998; KOZŁOWSKI 2000; SKORACKA & BOCZEK 2000; SKORACKA & KOZŁOWSKI 2002).

## *Acaralox* KEIFER, 1966

### *Acaralox arundinaceus* SKORACKA, 2002

DESCRIPTION

Complete description in SKORACKA (2002).

Female (n=15) (Figs 49-50): Body vermiform with long dorsal furrow. Body length 215-285; width 53-66. Gnathosoma 24-30 long; chelicerae 23-26 long.

Prodorsal shield: 38-42 long, 46-53 wide. Rhomboidal, with sinuous margins and little lobe over the base of chelicerae. Sculpture: median line in rear 2/3, in anterior 1/3 composed of small granules; admedian lines complete, sinuous; I submedian lines subparallel to admedian; II submedian lines subparallel to lateral margin of shield; arched transversal on rear half of shield. Setae *sc* 47-53 long, 24-29 apart, projecting to rear.

Coxae: numerous lines and granules. Sternal line slender.

Opisthosoma with 55-60 dorsal annuli, 57-63 ventral annuli, 5-7 coxigenital annuli. Annuli with microtubercles: dorsal subrounded, sparse; ventral rounded, ahead of annuli margins.

Leg I: 40-48; femur 10-12, seta *bv* 11-16; genu 6-8, seta *l''* 28-32; tibia 9-10, seta *l'* 10-17; tarsus 8-11; solenidion $\omega$ 10-11; empodium 11-13, simple, 7-8-rayed, symmetrical.

Leg II: 37-44; femur 10-12, *bv* 18-22; genu 5-6, *l''* 14-20; tibia 7-8; tarsus 9-10; solenidion $\omega$ 10-12; empodium 12-13, 7-8-rayed, symmetrical.

Genital parts 14-19 long, 22-24 wide, genital coverflap with 8-11 longitudinal ribs.

Length of setae: pedipalpal: *d* 10-13; *v* 2; coxal: *1b* 8-10; *1a* 23-30; *2a* 46-59; opisthosomal: *c2* 45-57; *d* 57-74; *e* 12-19; *f* 23-30; *h1* 2-4; *h2* 86; *3a* 19-28.

Distance between tubercles bearing coxal setae: *1b* 12-14; *1a* 7-10; *2a* 24-30; *1b* and *1a* 10-12; *1a* and *2a* 9-11.

Male, nymph and larva not found

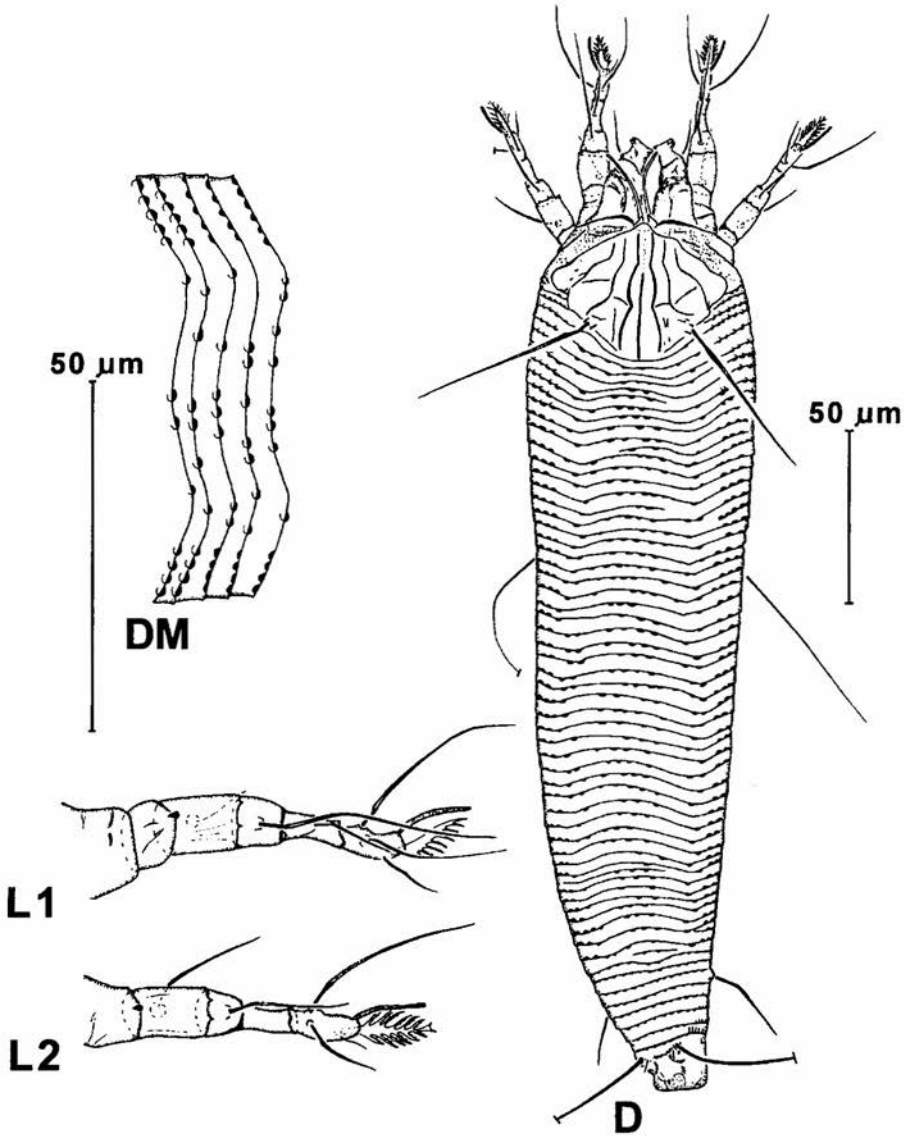
HOST PLANT

*Phalaris arundinacea* L. Relation to host plant: vagrant on the upper leaf surface and in leaf sheaths; leaves discoloured and rolled.

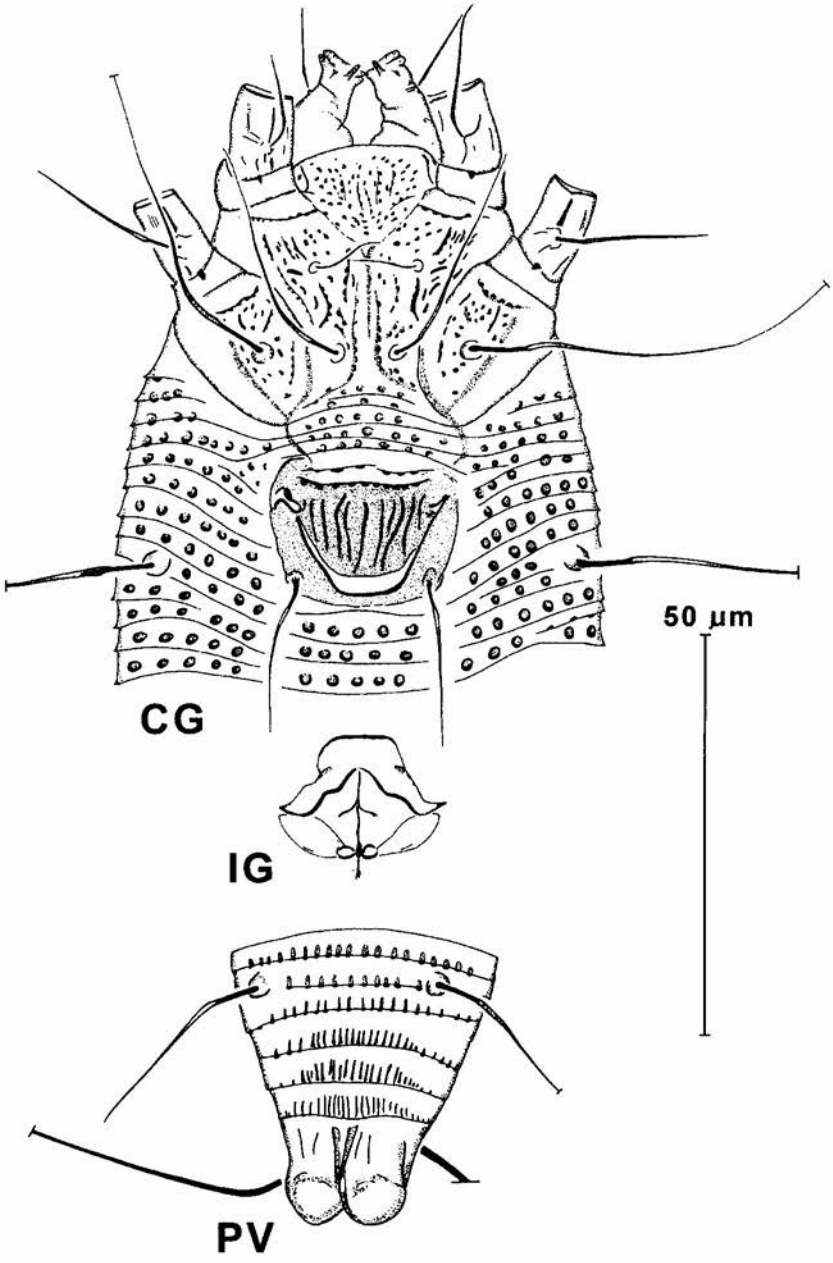
MATERIAL

62 females from Poznań, Cytadela park, not mowed meadow near the road [PC6], 28.11.1999, leg. AS.

Other records: *P. arundinacea*: [PLM2] - 25.10.1998, (66); 23.10.1999, (144); [PC6] - 23.09.1999, (914).




49. *Acaralox arundinaceus* SKORACKA, female: D – dorsal aspect, DM – dorsal microtubercles, L1, L2 – legs I and II




50. *Acaralox arundinaceus* SKORACKA, female: CG – coxigenital region, IG – internal genitalia, PV – ventral telosome

ECOLOGICAL NOTES

The species is the specialist I on *P. arundinacea*, which is specific host for this mite. The values of mites infestation ($n$=185; $k$=22): $P$=11.9% (*Cl*: 7.6%-17.5%); $I$=78.6 (*Cl*: 43.8-141.1) specimens per shoot; $D$=9.3 (*Cl*: 5.2-16.8) specimens per shoot.

GENERAL DISTRIBUTION

Palearctic Region. The species so far was recorded in Poland (SKORACKA 2002).

## Subfamily: Phyllocoptinae NALEPA, 1892
## Tribe: Anthocoptini AMRINE et STASNY, 1994
## *Abacarus* KEIFER, 1944

### *Abacarus acutatus* SUKHAREVA, 1985

DESCRIPTION

Female (n=13) (Figs 51-53): Body spindleform, with dorsal ridge narrow and reaching telosoma. Body length 199-283; width 53-65. Gnathosoma 22-28 long; chelicerae 21-23 long.

Prodorsal shield: 48-52 long, 40-48 wide. Rhomboidal with large, rounded lobe over gnathosoma, in some specimens lobe with 2 to 4 (mostly 3) spines. Sculpture: median line on 1/3 rear half, anteriorly split; admedian lines complete, parallel to each other; I and II submedian lines absent. Tubercles of setae *sc* on rear margin of shield, setae *sc* 22-30 long, 24-28 apart, projecting to rear. Minute, conical microtubercles present on surface near shield.

Coxae: with a pattern of numerous lines, dashes and minute microtubercles; numerous, subrounded microtubercles on infracapitulum. Sternal line slender.

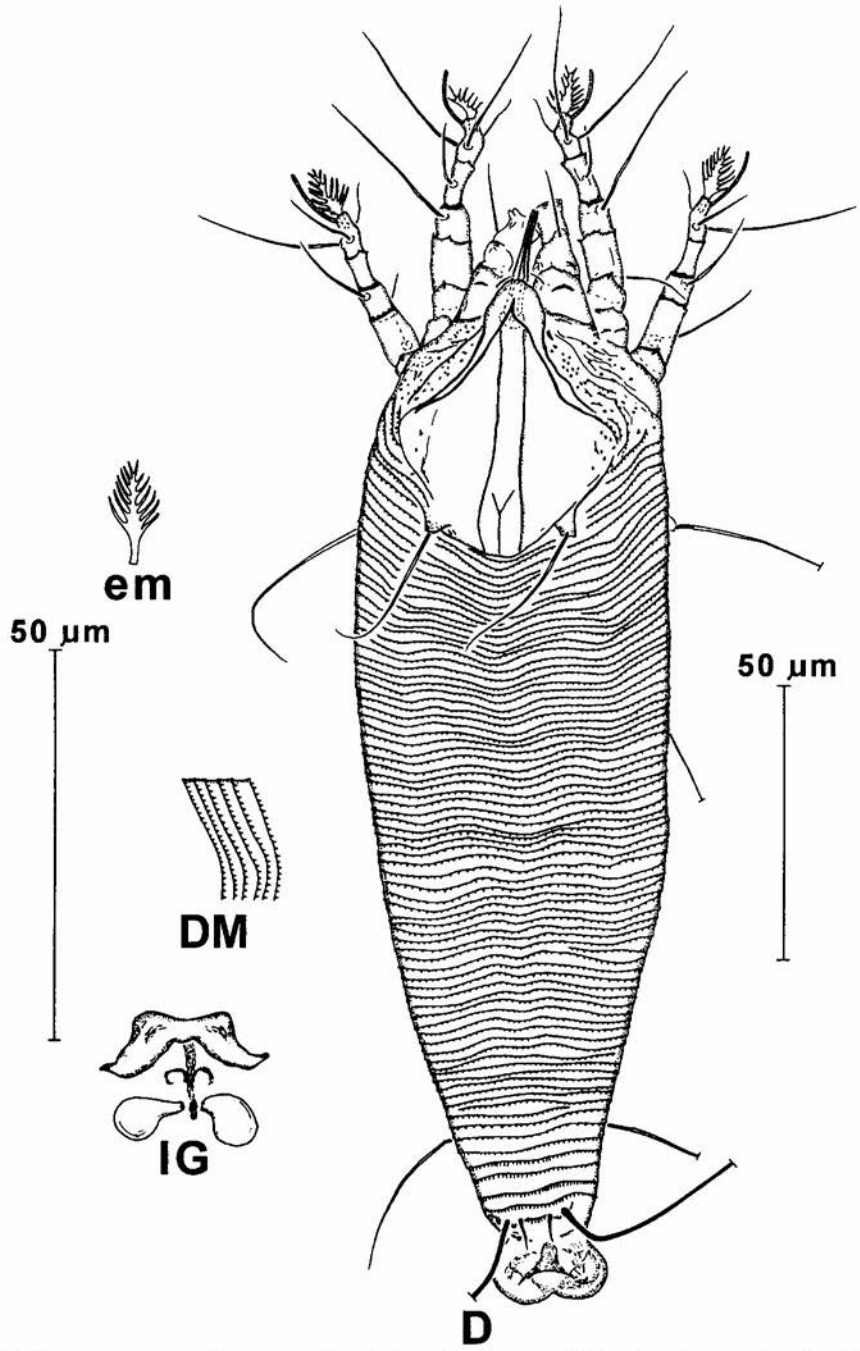
Opisthosoma with 64-81 dorsal annuli, 67-82 ventral annuli, 5-7 coxigenital annuli. Dorsal and ventral annuli with minute and conical microtubercles, set along annuli margins, on telosomal annuli elongated; in some specimens dorsal microtubercles hide under annuli.

Leg I: 36-45; femur 10-13, seta *bv* 14-22; genu 5-6, seta *l''* 29-31; tibia 8-10, seta *l'*-10-13; tarsus 8-10, setae: *ft''* 27-32; *ft'* 23-31, *u'* 7-10; solenidion $\omega$ 9-11; empodium 10-13, simple, 7-8-rayed, symmetrical. Position of setae: *bv* 4-6; *l''* 4-5; *l'* 4-5; *ft''* and *ft'* 3; *u'* 4-6.

Leg II: 36-44; femur 10-13, *bv* 18-24; genu 5-6, *l''* 12-19; tibia 6-8; tarsus 8-9, *ft''* 26-30, *ft'* 10-13, *u'* 7-12; solenidion $\omega$ 10-12; empodium 11-13, 7-8-rayed, symmetrical. Position of setae: *bv* 5-6; *l''* 4-5; *ft''* and *ft'* 2-3; *u'* 4-6.

Genital parts 14-17 long, 22-24 wide, genital coverflap with 11-17 longitudinal ribs.

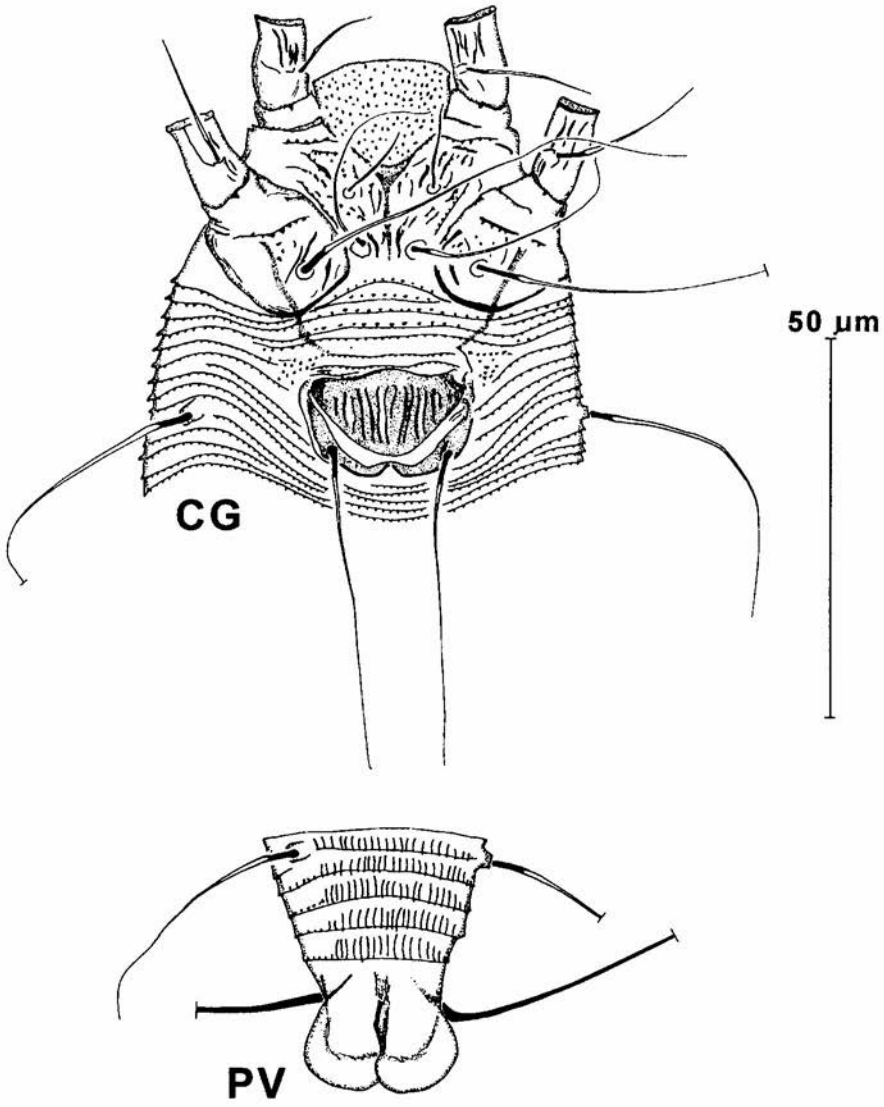
Length of setae: pedipalpal: *d* 10-13; *v* 2-4; *ep* 2-4; coxal: *1b* 9-15; *1a* 28-38; *2a* 47-60; opisthosomal: *c2* 32-44; *d* 46-63; *e* 40-52; *f* 27-37; *h1* 4-7; *h2* 77-85; *3a* 31-48.



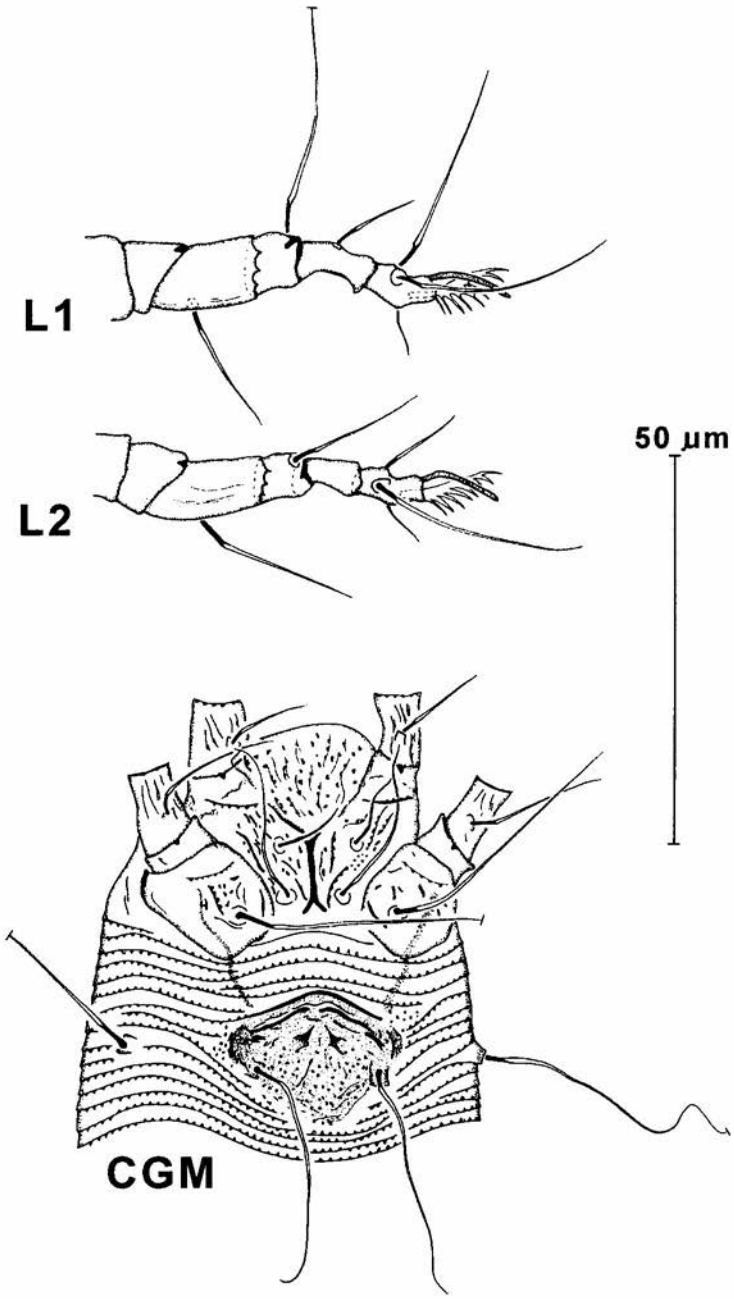

51. *Abacarus acutatus* SUKHAREVA, female: D – dorsal aspect, DM – dorsal microtubercles, IG – internal genitalia, em – empodium

Distance between tubercles bearing setae: coxal: *1b* 10-11; *1a* 7-9; *2a* 21-25; *1b* and *1a* 7-10; *1a* and *2a* 8-10; opisthosomal: *c2* 46-63; *d* 29-41; *e* 12-19; *f* 19-25; *3a* 14-17; telosomal: *h1* 5-8; *h2* 10-11; *h1* and *h2* 2-3.

Number of ventral annuli bearing setae: *c2* 8-11; *d* 21-27; *e* 39-48; *f* 63-78, 5 from rear.



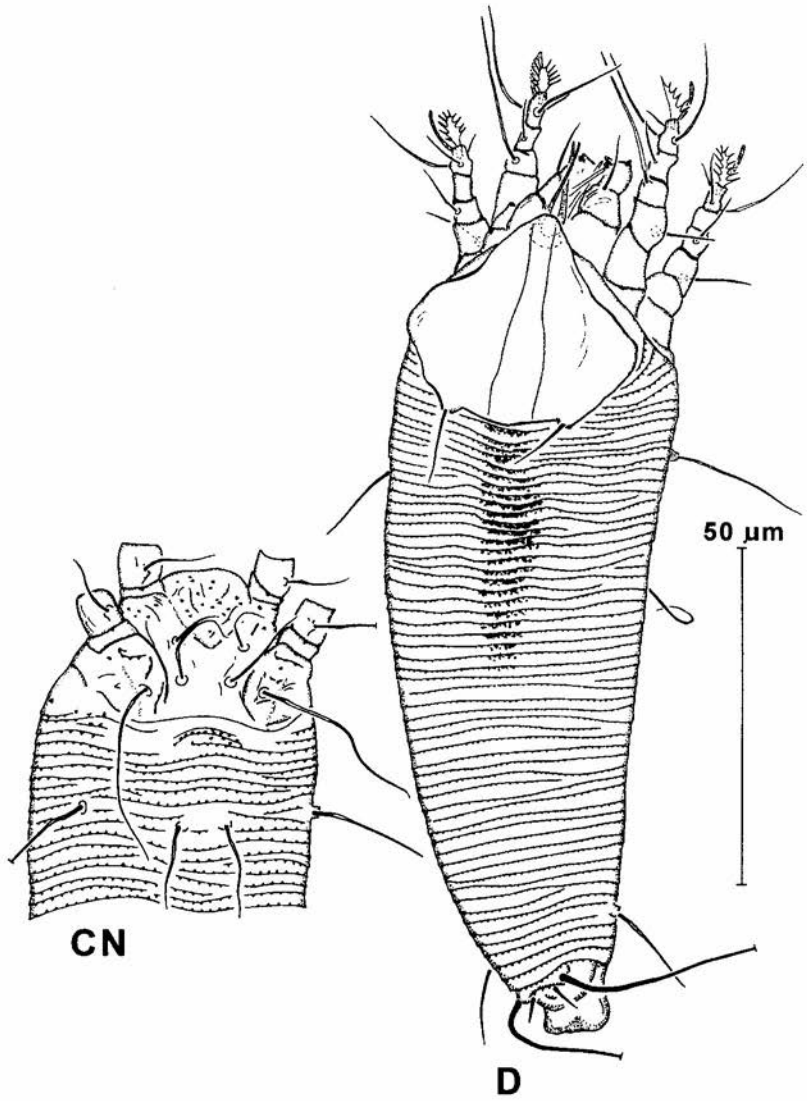

52. *Abacarus acutatus* SUKHAREVA, female: CG – coxigenital region, PV – ventral telosome




53. *Abacarus acutatus* SUKHAREVA: L1, L2 – legs I and II of female, CGM – coxigenital region of male

Male (n=4): Body spindleform, with dorsal ridge narrow and reaching 2/3 of body. Body length 154-197; width 46-49. Gnathosoma 19-23 long; chelicerae 19-21 long.

Prodorsal shield: 42-47 long, 38-41 wide. Shape and sculpture similar to that of female. Tubercles of setae *sc* on rear margin of shield, setae *sc* 20-24 long, 21-25 apart, projecting to rear.

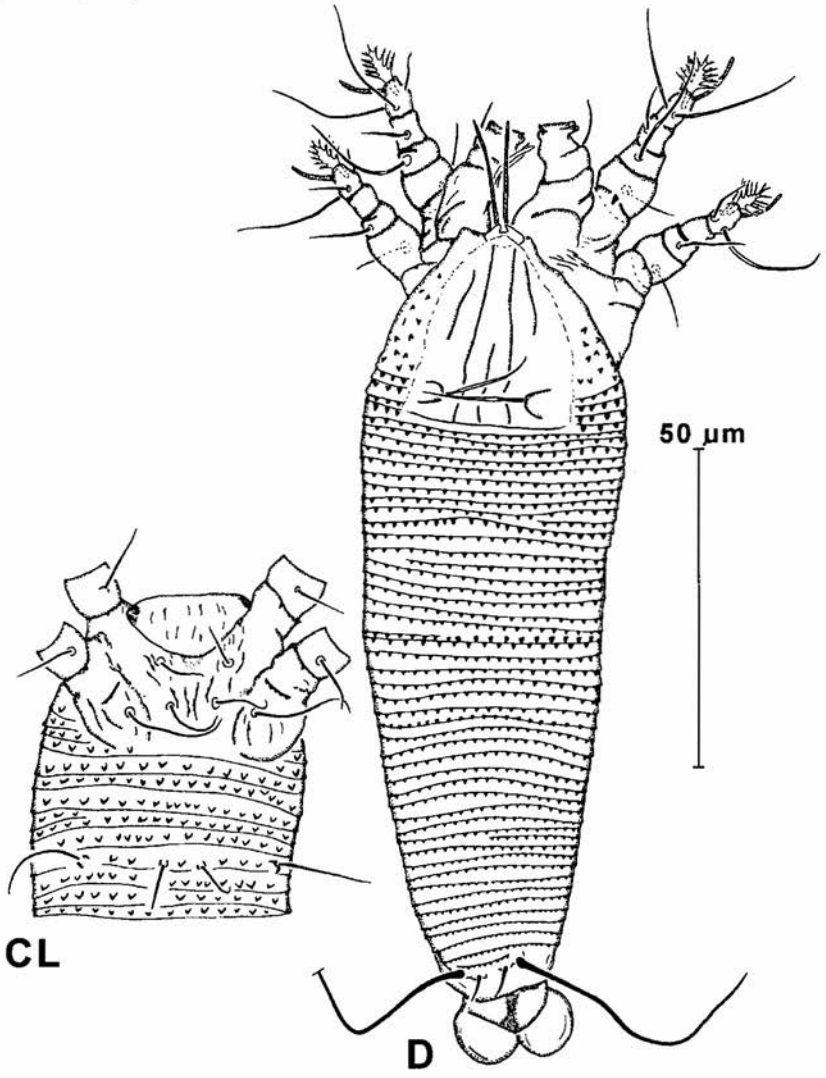



54. *Abacarus acutatus* SUKHAREVA, nymph: CN - coxisternum and *3a* and *c2* setae, D – dorsal aspect

Coxae: with a pattern similar to that of female (Fig. 53).

Opisthosoma with 65-68 dorsal annuli, 65-71 ventral annuli, 5-6 coxigenital annuli. Dorsal annuli smooth, except 5-8 posterior annuli with conical microtubercles; ventral similar to that of female.

Leg I: 32-36; femur 9-10, seta *bv* 12-14; genu 5-6, seta *l"* 24-25; tibia 7-8, seta *l'* 8-9; tarsus 7-8, setae: *ft"* 23-27; *ft'* 21-23, *u'* 6-8; solenidion *ω* 9-10; empodium 10, simple, 6-7–rayed, symmetrical. Position of setae: *bv* 4-5; *l"* 4; *l'* 3-4; *ft"* and *ft'* 3; *u'* 4-5.




55. *Abacarus acutatus* SUKHAREVA, larva: CL – coxisternum and *3a* and *c2* setae, D – dorsal aspect

Leg II: 30-33; femur 10, *bv* 16-21; genu 4-5, *l"* 11-14; tibia 6; tarsus 7-8, *ft"* 24-27, *ft'* 9 11, *u'* 6-8; solenidion *ω* 9-10; empodium 10-11, 6-7-rayed, symmetrical. Position of setae: *bv* 4-5; *l''* 3-4; *ft"* and *ft'* 2; *u'* 4.

Genital parts 14-16 long, 20-21 wide, surface below the eugenital setae with numerous microtubercles (Fig. 53).

Length of setae: pedipalpal: *d* 9-10; *v* 2; coxal: *1b* 10; *1a* 25-36; *2a* 43; opisthosomal: *c2* 33-38; *d* 40-48; *e* 38-50; *f* 24-33; *h1* 4-5; *h2* 64-71; *3a* 28-43.

Distance between tubercles bearing setae: coxal: *1b* 9-10; *1a* 6-9; *2a* 19-21; *1b* and *1a* 7-8; *1a* and *2a* 7-8; opisthosomal: *c2* 40-46; *d* 27-28; *e* 11-14; *f* 19-22; *3a* 15-16; *h1* 6; *h2* 9-10; *h1* and *h2* 2.

Number of ventral annuli bearing setae: *c2* 7-8; *d* 18-21; *e* 35-39; *f* 61-67, 5 from rear.

Nymph (n=11) (Fig. 54): Body spindleform, dorsal ridge slender, present on anterior part of opisthosoma. Body length 162-210; width 44-51. Gnathosoma 16-23 long; chelicerae 15-20 long.

Prodorsal shield: 38-43 long, 36-41 wide. Shape similar to that of female. Sculpture: median line absent, admedian lines similar to that of female. Tubercles of setae *sc* on rear margin of shield, setae *sc* 12-16 long, 18-23 apart, projecting to rear.

Coxae: almost smooth; few lines and microtubercles present on coxae II and infacapitulum. Sternal line absent.

Opisthosoma with 57-71 dorsal annuli, 54-61 ventral annuli, 8-12 coxigenital annuli. Annuli with microtubercles: similar to that of female.

Leg I: 27-31; femur 7-9, seta *bv* 8-14; genu 4-5, seta *l"* 17-20; tibia 5-7, seta *l'* 6-10; tarsus 6-7, setae: *ft"* 17-21; *ft'* 14-19, *u'* 5-6; solenidion *ω* 7-8; empodium 8-9, simple, 6–rayed, symmetrical. Position of setae: *bv* 4; *l"* 3-4; *l'* 3-4; *ft"* and *ft'* 2; *u'* 3-4.

Leg II: 26-29; femur 7-9, *bv* 10-15; genu 4-5, *l"* 8-11; tibia 4-5; tarsus 6-7, *ft"* 16-23, *ft'* 7-10, *u'* 5-6; solenidion *ω* 7-9; empodium 9-10, 6-rayed, symmetrical. Position of setae: *bv* 4-5; *l"* 3; *ft"* and *ft'* 2; *u'* 3-4.

Length of setae: pedipalpal: *d* 6-8; *v* 2-3; *ep* 2; coxal: *1b* 6-8; *1a* 19-28; *2a* 29-38; opisthosomal: *c2* 21-30; *d* 25-43; *e* 14-17; *f* 20-28; *3a* 10-13; *h1* 3-4; *h2* 57-68.

Distance between tubercles bearing setae: coxal: *1b* 8-10; *1a* 7-8; *2a* 20-23; *1b* and *1a* 7-11; *1a* and *2a* 7-9; opisthosomal: *c2* 36-44; *d* 22-28; *e* 8-13; *f* 20-23; *3a* 8-10; *h1* 5-6; *h2* 8-10; *h1* and *h2* 2.

Number of ventral annuli bearing setae: *c2* 8-11; *d* 20-22; *e* 32-37; *f* 50-57, 5 from rear.

Larva (n=4) (Fig. 55): Body spindle-vermiform. Body length 145-147; width 42. Gnathosoma 19-21 long; chelicerae 16-20 long.

Prodorsal shield: 30-33 long, 32 wide. Triangular, without anterior lobe. Sculpture: median and admedian lines similar to that of female; I submedian lines

on the posterior half of shield, parallel to admedian; submedian lines II absent. Tubercles of setae *sc* ahead from posterior margin of shield, setae *sc* 8-15 long, 15 apart, projecting to center of shield. Conical microtubercles present on surface near shield.

Coxae: few lines with subrounded microtubercles. Sternal line absent.

Opisthosoma with 37-45 dorsal annuli, 30-35 ventral annuli, 5-6 coxigenital annuli. Annuli with microtubercles: dorsal similar to that of female; ventral subrounded, slightly ahead of annuli margins.

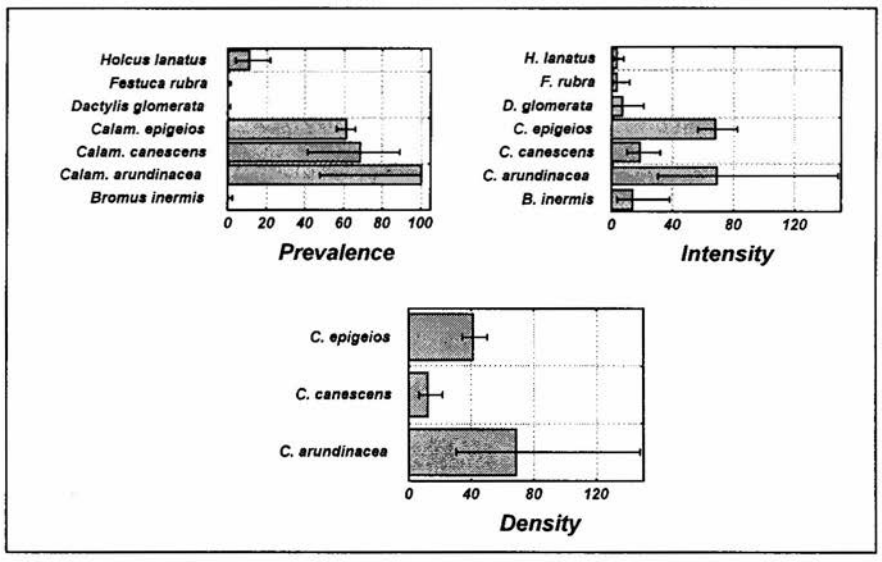
Leg I: 22-28; femur 6, seta *bv* 10; genu 4, seta *l"* 16-18; tibia 4-5, seta *l'* 5-7; tarsus 5-6, setae: *ft"* 17-20; *ft'* 12-15, *u'* 5; solenidion *ω* 6-7; empodium 6-9, simple, 5-6–rayed, symmetrical. Position of setae: *bv* 3; *l"* 2-3; *l'* 2; *ft"* and *ft'* 2; *u'* 3-4.

Leg II: 18-24; femur 6-7, *bv* 10; genu 3-4, *l"* 8-10; tibia 3-4; tarsus 4-6, *ft"* 15-19, *ft'* 7-8, *u'* 4; solenidion *ω* 7; empodium 7-9, 5-6-rayed, symmetrical. Position of setae: *bv* 4; *l"* 2-3; *ft"* and *ft'* 2; *u'* 3-4.

Length of setae: pedipalpal: *d* 5-6; *v* 2; coxal: *1b* 6; *2a* 19-31; opisthosomal: *c2* 12-17; *d* 15-17; *e* 10-18; *f* 16-19; *h1* 3-5; *h2* 57; *3a* 6-9.

Distance between tubercles bearing setae: coxal: *1b* 10; *1a* 7; *2a* 19; *1b* and *1a* 8; *1a* and *2a* 7; opisthosomal: *c2* 30; *d* 19; *e* 10; *f* 14; *3a* 6-7; *h1* 5; *h2* 9; *h1* and *h2* 2.

Number of ventral annuli bearing setae: *c2* 6; *d* 11-12; *e* 18-19; *f* 27-31, 4 from rear.




56. Prevalence, intensity and density of infestation of *Abacarus acutatus* on grass species. Explanation of abbreviation: "*Calam.*'- *Calamagrostis*

HOST PLANT

*Calamagrostis epigeios* (L.) ROTH. Relation to host plant: vagrant in grooves on the upper leaf surface; no visible damage.

MATERIAL

157 females, 31 males, 98 nymphs, 27 larvae from Poznań, Lasek Marceliński forest, not mowed meadow near the forest margin [PLM2], 30.04.1999, leg. AS.

Other records: *Bromus inermis*: [PWH] - 24.08.1999, (54); *Calamagrostis arundinacea*: [BSP2] - 25.08.1999, (343); *C. canescens*: [PBP4] - 07.04.2000, (137); [BIA1] - 01.05.2000, (67); *C. epigeios*: [PBP5] - 19.08.1998, (25); [PBP3] - 19.08.1998, (118); [OP2] - 12.06.1999, (169); [PLM1] - 25.10.1998, (64); 26.01.1999, (136); 20.06.1999, (76); 23.09.1999, (304); 23.10.1999, (941); 27.12.1999, (86); 29.02.2000, (58); 29.03.2000, (48); [PLM2] - 25.10.1998, (173); 23.05.1999, (521); 20.06.1999, (1708); 30.07.1999, (306); 31.08.1999, (576); 23.09.1999, (907); 23.10.1999, (733); 28.11.1999, (262); 27.12.1999, (708); 22.01.2000, (1075); 29.02.2000, (208); 29.03.2000, (45); [PC6] - 30.07.1999, (1380); 31.08.1999, (493); 23.09.1999, (2090); 30.10.1999, (1238); 28.11.1999, (215); 27.12.1999, (56); 29.01.2000, (41); 28.02.2000, (75); 29.03.2000, (140); [KUG1] - 12.07.1998, (68); [LGW1] - 14.06.1999, (135); [GLD1] - 04.04.1999, (505); 23.04.2000, (183); [ME1] - 21.07.1999, (64); *Dacylis glomerata*: [PLM3] - 29.02.2000, (13); *Festuca rubra*: [PC13] - 29.01.2000, (16); *Holcus lanatus*: [PLM2a] - 23.05.1999, (22).

ECOLOGICAL NOTES

Specialist II, with three specific hosts: *Calamagrostis arundinacea*, *C. epigeios*, *C. canescens* and four accidental hosts (Table 8, Fig. 56)

Table 8

Parameters of infestation of *Abacarus acutatus*. For legend see Table 2.

| Host species | *n* | *k* | *P* | *LCI* | *UCI* | *I* | *LCI* | *UCI* | *D* | *LCI* | *UCI* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. *Bromus inermis**** | 401 | 4 | 1.0 | 0.3 | 2.5 | 13.5 | 3.8 | 38.3 | 0.1 | 0.0 | 0.4 |
| 2. *Calamagrostis arundinacea** | 5 | 5 | 100.0 | 47.8 | 100.0 | 68.6 | 30.4 | 148.0 | 68.6 | 30.4 | 148.0 |
| 3. *Calamagrostis canescens** | 16 | 11 | 68.8 | 41.3 | 89.0 | 18.5 | 10.1 | 31.8 | 12.8 | 6.9 | 21.9 |
| 4. *Calamagrostis epigeios** | 397 | 243 | 61.2 | 56.2 | 66.0 | 67.7 | 56.4 | 82.4 | 41.5 | 34.5 | 50.4 |
| 5. *Dactylis glomerata**** | 541 | 2 | 0.4 | 0.0 | 1.3 | 6.5 | 0.0 | 21.0 | 0.0 | 0.0 | 0.1 |
| 6. *Festuca rubra**** | 682 | 4 | 0.6 | 0.2 | 1.5 | 4.0 | 1.0 | 11.8 | 0.0 | 0.0 | 0.1 |
| 7. *Holcus lanatus**** | 56 | 6 | 10.7 | 4.0 | 21.9 | 3.7 | 1.2 | 7.7 | 0.4 | 0.1 | 0.8 |

GENERAL DISTRIBUTION

Palearctic Region. So far, the species was recorded in Russia and Poland (SUKHAREVA 1985; SKORACKA & BOCZEK 2000).

### *Abacarus compactus* SUKHAREVA 1977

REMARKS

The species was found in Poland on: *Bromus mollis*, *Festuca pratensis*, *F. rubra*, *Lolium x boucheanum*, *L. perenne*, living in grooves between veins on the upper leaf blade (KOZŁOWSKI 2001). Originally described from *Festuca ovina* in Russia (SUKHAREVA 1977).

### *Abacarus hystrix* (NALEPA, 1896)

*Callyntrotus hystrix* NALEPA, 1896
*Phytocoptes hystrix* (NALEPA, 1896)
*Epitrimerus hystrix* (NALEPA, 1896)
*Phyllocoptes hystrix* (NALEPA, 1896)

DESCRIPTION

Female (n=30) (Figs 57-60): Body spindleform, with dorsal ridge narrow and reaching telosoma. Body length 170-289; width 61-70. Chelicerae 19-30 long.

Prodorsal shield: 46-51 long, 40-49 wide. Anterior half triangular, posterior half semicircular, with long, subrounded lobe over base of chelicerae. Sculpture: median line absent; admedian lines complete, parallel to each other; I submedian lines subparallel to lateral margin of shield. Tubercles of setae *sc* on rear margin of shield, setae *sc* 29-46 long, 28-35 apart, projecting to rear.

Coxae: with a pattern of numerous dashes. Sternal line distinct.

Opisthosoma with 66-78 dorsal annuli, 67-82 ventral annuli, 5-6 coxigenital annuli. Annuli with minute and conical microtubercles, set along annuli margins.

Leg I: 36-43; femur 11-13, seta *bv* 12-17; genu 6-7, seta *l''* 29-30; tibia 7-9, seta *l'* 10-14; tarsus 6-9, setae: *ft''* 28-29; *ft'* 29; solenidion $\omega$ 10-11; empodium 10-12, simple, 8-9-rayed, symmetrical.

Leg II: 33-38; femur 8-13, *bv* 22-30; genu 5-6, *l''* 14-19; tibia 5-9; tarsus 6-9, *ft''* 28-29; solenidion $\omega$ 10-11; empodium 11-12, 8-9-rayed, symmetrical.

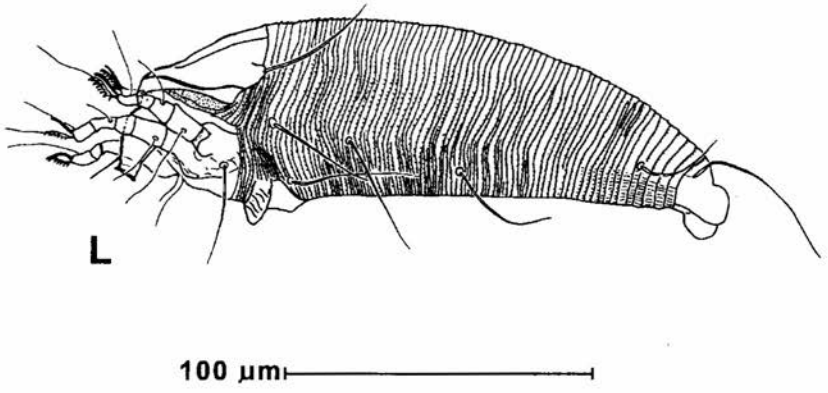
Genital parts 10-18 long, 22-25 wide, genital coverflap with 11-13 longitudinal ribs.

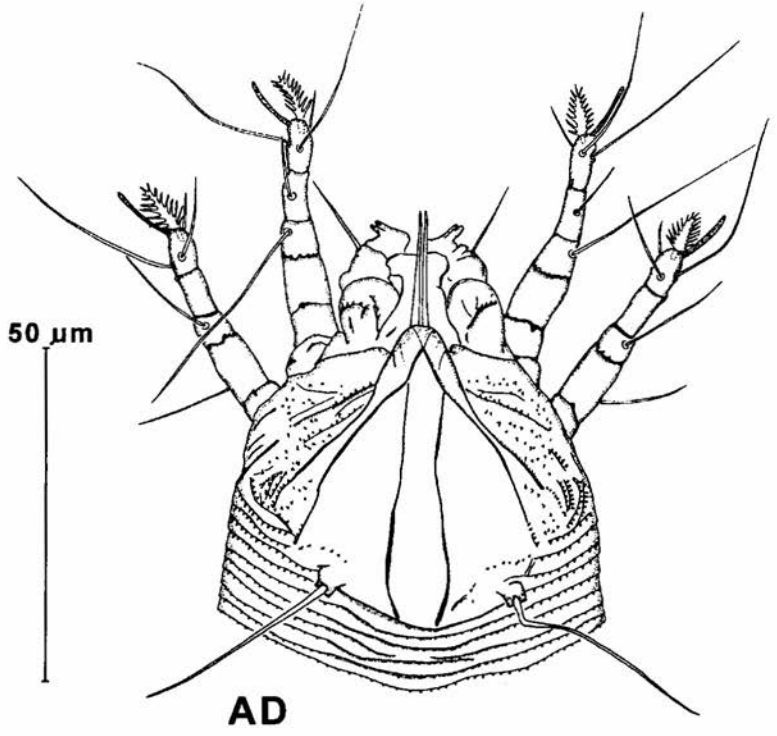
Length of setae: pedipalpal: *d* 10-12; coxal: *1b* 13-19; *1a* 19-38; *2a* 39-62 opisthosomal: *c2* 44-57; *d* 41-65; *e* 33-54; *f* 25-42; *h1* 4-6; *h2* 81-105; *3a* 33-62.

Distance between tubercles bearing setae: coxal: *1b* 7-13; *1a* 7-10; *2a* 21-30; *1b* and *1a* 7-9; *1a* and *2a* 9-11; opisthosomal: *c2* 53-68; *d* 37-47; *e* 16-23; *f* 24-29; *3a* 15-20; *h1* 7-9; *h2* 11-13; *h1* and *h2* 2-3.

Number of ventral annuli bearing setae: *c2* 7-10; *d* 22-27; *e* 40-48; *f* 64-78, 5 from rear.

Male (n=6): Body spindleform. Body length 160-214; width 53-55. Gnathosoma 23-29 long; chelicerae 19-25 long.



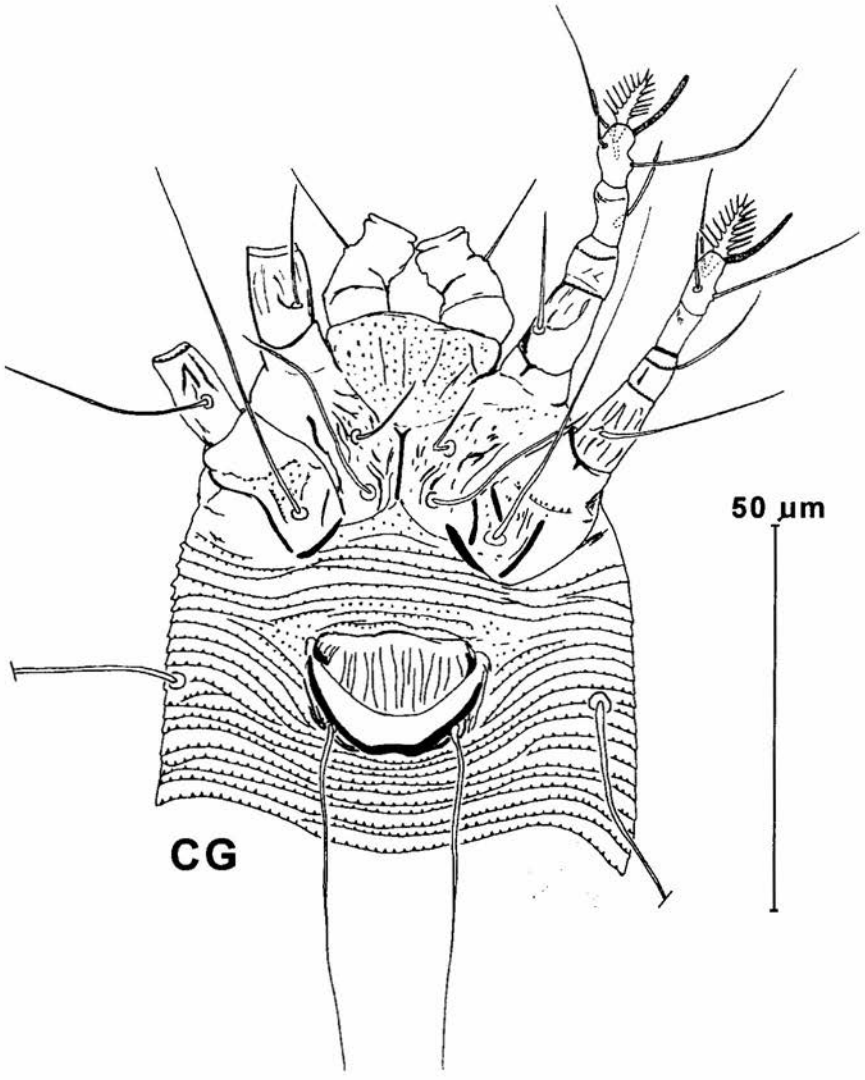




57. *Abacarus hystrix* (NALEPA), female: AD – antero-dorsal aspect, L – lateral aspect

Prodorsal shield: 40-46 long, 43-44 wide. Shape and sculpture similar to that of female. Tubercles of setae *sc* on rear margin of shield, setae *sc* 21-27 long, 27-32 apart, projecting to rear.

Coxae: with a pattern similar to that of female.

Opisthosoma with 58-68 dorsal annuli, 57-91 ventral annuli, 5-6 coxigenital annuli. Annuli with microtubercles similar to that of female.



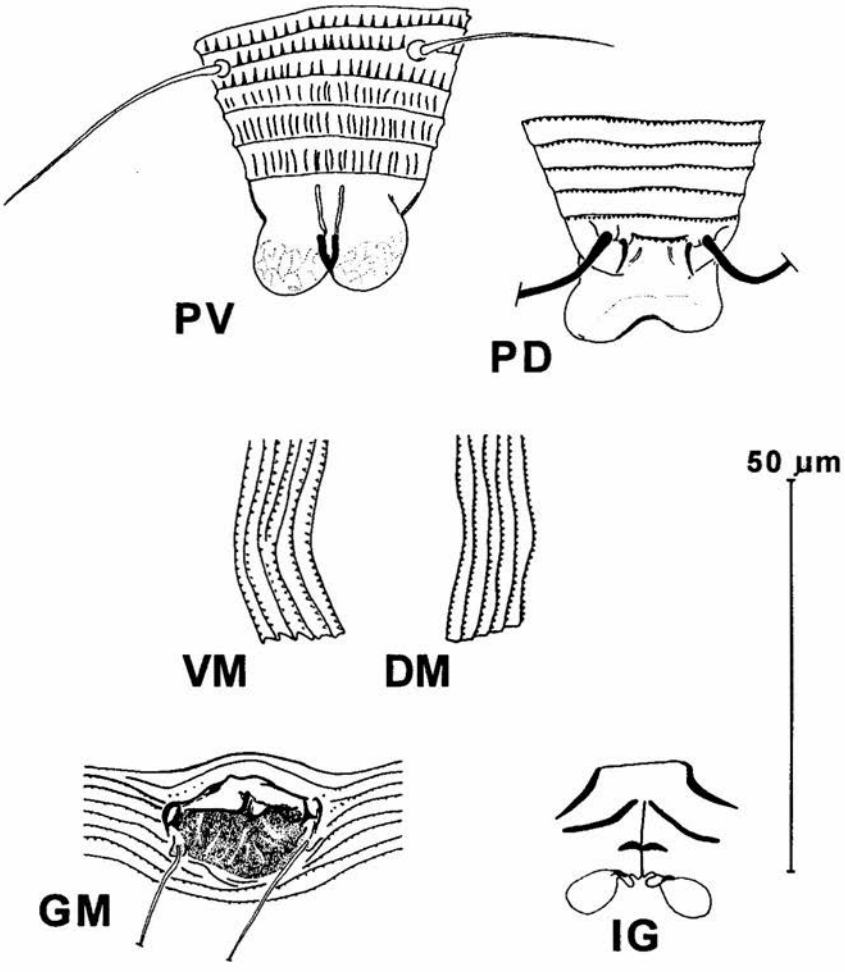

58. *Abacarus hystrix* (NALEPA), female: CG – coxigenital region

Leg I: 30-38; femur 10, seta *bv* 11-14; genu 5-6, seta *l"* 24-33; tibia 6-7, seta *l'* 8-10; tarsus 7-8, setae: *ft"* 22-27; *ft'* 22-27; solenidion $\omega$ 10; empodium 10-11, simple, 7-8–rayed, symmetrical.

Leg II: 30-36; femur 10, *bv* 16-22; genu 4-5, *l"* 12-17; tibia 6-7; tarsus 7-8, *ft"* 22-25; solenidion $\omega$ 10; empodium 10, 7-8-rayed, symmetrical.

Genital parts 14-16 long, 19-21 wide, surface below the eugenital setae with conical microtubercles (Fig. 59).

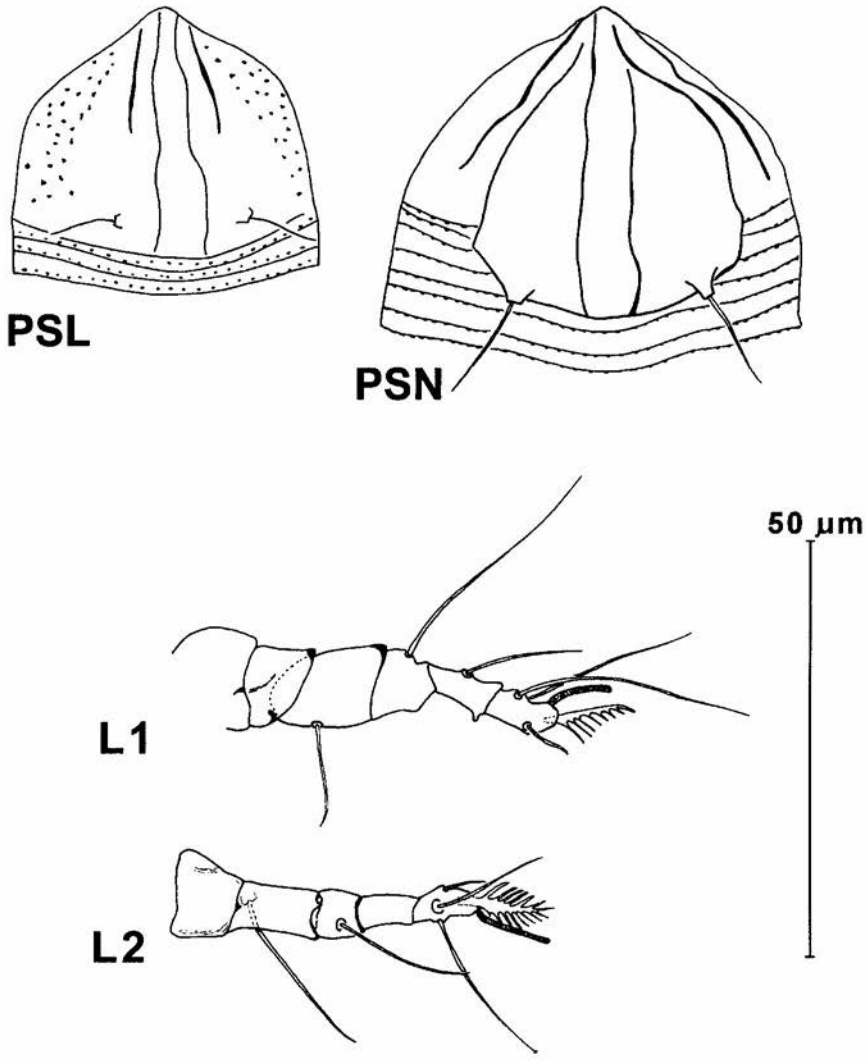
Length of setae: pedipalpal: *d* 9-10; coxal: *1b* 8-11; *1a* 21-33; *2a* 28-48; opisthosomal: *c2* 33-48; *d* 30-57; *e* 24-35; *f* 25-30; *3a* 25-29; *h1* 4-6, *h2* 71-93.




59. *Abacarus hystrix* (NALEPA): DM – dorsal microtubercles of female, GM – genital region of male, IG – internal genitalia of female, PD – posterior telosome of female, PV – ventral telosome of female, VM – ventral microtubercles of female

Distance between tubercles bearing setae: coxal: *1b* 8-11; *1a* 7-9; *2a* 20-24; *1b* and *1a* 7-8; *1a* and *2a* 8-9; opisthosomal: *c2* 42-52; *d* 32-35; *e* 14-19; *f* 23-27; *3a* 16-19; *h1* 6-8; *h2* 10-12; *h1* and *h2* 2-3.

Number of ventral annuli bearing setae: *c2* 8-10; *d* 19-24; *e* 34-41; *f* 53-69, 5 from rear.




60. *Abacarus hystrix* (NALEPA): PSL – prodorsal shield of larva, PSN – prodorsal shield of nymph, L1, L2 – legs I and II of female

Nymph (n=7): Body spindleform. Body length 140-212; width 48-56. Gnathosoma 21-27 long; chelicerae 17-20 long.

Prodorsal shield: 38-42 long, 37-46 wide. Shape and sculpture: similar to that of female, except I submedian lines which are absent (Fig. 60). Tubercles of setae *sc* on rear margin of shield, setae *sc* 12-16 long, 24-27 apart, projecting to rear.

Coxae: with pattern similar to that of female.

Opisthosoma with 58-63 dorsal annuli, 49-58 ventral annuli. Annuli with microtubercles: similar to that of female, except ventral which are more minute.

Leg I: 23-27; femur 6-8, seta *bv* 9-10; genu 4-5, seta *l"* 20-26; tibia 5-6, seta *l'* 5-8; tarsus 5-6, setae: *ft"* 18-21; *ft'* 12-20; solenidion $\omega$ 7-9; empodium 7-9, simple, 6-8–rayed, symmetrical.

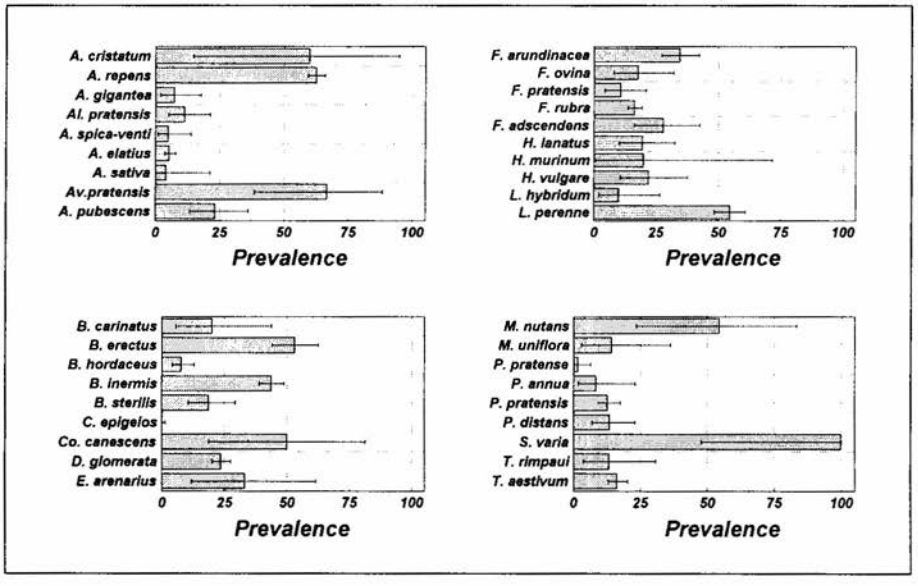
Leg II: 23-27; femur 6-8, *bv* 9-17; genu 4-5, *l"* 9-11; tibia 4-5; tarsus 5-6, *ft"* 17-20; solenidion $\omega$ 7-9; empodium 7-9, 6-8-rayed, symmetrical.

Length of setae: pedipalpal: *d* 7-9; coxal: *1b* 6-7; *1a* 11-19; *2a* 20-43; opisthosomal: *c2* 25-34; *d* 19-31; *e* 14-17; *f* 20-27; *3a* 10-20; *h1* 3-5; *h2* 65-71.

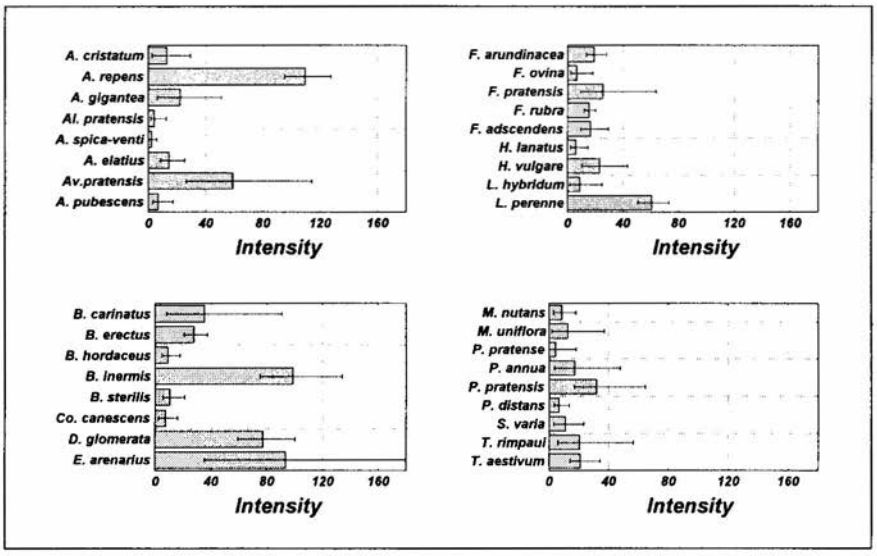
Distance between tubercles bearing setae: coxal: *1b* 9-10; *1a* 8-10; *2a* 21-24; *1b* and *1a* 7-8; *1a* and *2a* 7-9; opisthosomal: *c2* 41-51; *d* 28-33; *e* 13-19; *f* 21-28; *3a* 9-11; *h1* 6-7; *h2* 10-11; *h1* and *h2* 2-3.

Number of ventral annuli bearing setae: *c2* 8-10; *d* 17-23; *e* 30-36; *f* 45-54, 5 from rear.

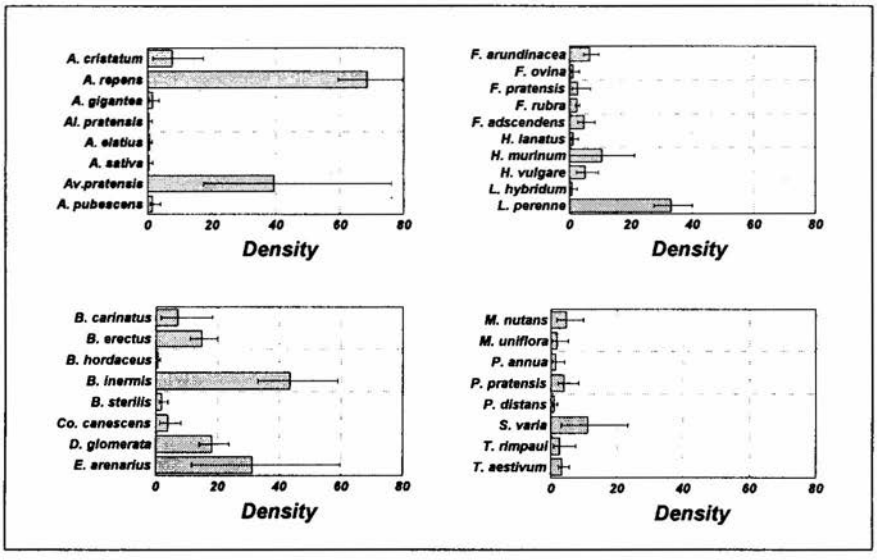
Larva (n=4): Body spindle-vermiform. Body length 130-158, width 41-46. Gnathosoma 17-20 long; chelicerae 15-19 long.




61. Prevalence of *Abacarus hystrix* on grass species. For generic names of grasses see the text




62. Intensity of infestation of *Abacarus hystrix* on grass species. For generic names of grasses see the text




63. Density of infestation of *Abacarus hystrix* on grass species. For generic names of grasses see the text

Prodorsal shield: 29-33 long, 33-38 wide. Triangular, without anterior lobe. Sculpture: median and admedian lines similar to that of female; I submedian lines on anterior half, parallel to admedian (Fig. 60). Tubercles of setae *sc* ahead from posterior margin of shield, setae *sc* 8-10 long, 15-18 apart.

Opisthosoma with 41-43 dorsal annuli, 29-33 ventral annuli. Annuli with subrounded microtubercles, ahead from annuli margins.

Leg I: 18-20; femur 5-6, seta *bv* 8-9; genu 3-4, seta *l"* 15-16; tibia 3-4, seta *l'* 5; tarsus 4-5, seta: *ft"* 8-9; solenidion $\omega$ 6-7; empodium 6-7, simple, 6–rayed, symmetrical.

Leg II: 17-19; femur 5-6, *bv* 8-10; genu 4, *l"* 6-8; tibia 3-4; tarsus 4-5, *ft"* 14-18; solenidion $\omega$ 7; empodium 6-7, 6-rayed, symmetrical.

Length of setae: pedipalpal: *d* 5-7; coxal: *1b* 5; *1a* 10; *2a* 12-14; opisthosomal: *c2* 16-21; *d* 14-23; *e* 8-14; *f* 13-24; *3a* 7-9; *h1* 2-4.

Distance between tubercles bearing setae: coxal: *1b* 9-10; *1a* 6-9; *2a* 19-22; *1b* and *1a* 6; *1a* and *2a* 7; opisthosomal: *c2* 36-41; *d* 24-29; *e* 13-17; *f* 19-21; *3a* 7; *h1* 5-6; *h2* 9-10; *h1* and *h2* 2.

Number of ventral annuli bearing setae: *c2* 7-8; *d* 13-14; *e* 19; *f* 28-29, 4 from rear.

HOST PLANT

*Agropyron repens* (L.) P. BEAUV. Relation to host plant: vagrant on the upper leaf surface; no visible damage.

MATERIAL

108 females, 32 males, 102 nymphs, 40 larvae from Poznań, Lasek Marceliński forest, not mowed meadow near the forest margin [PLM2], 30.04.1999, leg. AS.

Other records: *Agropyron cristatum*: [PKD] - 26.08.1999, (39); *A. repens*: [SLG1] - 12.07.1998, (19); 12.07.1998, (33); [MOG2] - 26.07.1998, (38); 26.07.1998, (116); [LGW1] - 14.06.1999, (79); [POP] - 01.08.1998, (29); [PMI] - 26.01.1999, (49); [PLD] - 31.01.1999, (21); 31.01.1999, (49); [PC4] - 25.02.1999, (83); [PC6] - 28.02.2000, (1307); [PC7] - 25.02.1999, (426); 20.06.1999, (642); [PC13] - 23.05.1999, (227); 13.04.1999, (335); 20.06.1999, (885); 31.08.1999, (1407); 23.09.1999, (882); 28.02.2000, (88); 29.03.2000, (17); [PLM10] - 30.04.1999, (98); 20.06.1999, (2400); 31.08.1999, (1491); 23.09.1999, (1063); 23.10.1999, (625); 28.11.1999, (496); 22.01.2000, (63); [PLM1] - 23.05.1999, (186); [BRP1] - 15.07.1998, (13); [PBP1] - 12.08.1998, (61); [PBP5] - 19.08.1998, (193); [CHK2] - 01.06.2000, (72), leg. AS&WM; 16.06.2000, (245), leg. AS&WM; 02.07.2000, (784), leg. AS&WM; 14.07.2000, (33), leg. AS&WM; 01.06.2001, (24), leg. AS&WM; 15.06.2001, (65), leg. AS&WM; 01.07.2001, (106), leg. AS&WM; 13.07.2001, (1192), leg. AS&WM; 01.08.2001, (1853), leg. AS&WM; 18.08.2001, (3491), leg. AS&WM; [CHK1] - 16.06.2000, (6), leg. AS&WM; 02.07.2000, (19), leg. AS&WM; 01.06.2001, (3504), leg. AS&WM; 15.06.2001, (2682), leg. AS&WM; 01.07.2001, (127), leg. AS&WM; 13.07.2001, (358), leg.

AS&WM; 01.08.2001, (22); 18.08.2001, (121); [SWC1] - 01.06.2000, (162), leg. AS&WM; 16.06.2000, (509), leg. AS&WM; 02.07.2000, (3160); 14.07.2000, (2254), leg. AS&WM; 31.07.2000, (384), leg. AS&WM; 18.08.2001, (5447), leg. AM&WM; [SWC2] - 01.06.2000, (118), leg. AS&WM; 16.06.2000, (154); 14.07.2000, (332), leg. AS&WM; 31.07.2000, (955); 19.08.2000, (1130); 01.06.2001, (5285), leg. AS&WM; 15.06.2001, (6920), leg. AS&WM; 01.07.2001, (3523), leg. AS&WM; 13.07.2001, (1382); 01.08.2001, (86); [SWC3] - 31.07.2000, (505); *Agrostis gigantea*: [PLM02] - 19.07.1998, (51); [MOG2] - 26.07.1998, (37); *Alopecurus pratensis*: [PC15] - 20.06.1999, (37); *Apera spica-venti*: [PLM2] - 20.06.1999, (7); *Arrhenantherum elatius*: [MOG2] - 26.07.1998, (26); [PLM2] - 23.05.1999, (27); [PC9] - 27.12.1999, (37); [PC13] - 30.07.1999, (61); 28.11.1999, (35); 29.03.2000, (6); [PC13a] - 31.08.1999, (206); *Avena sativa*: [SLG1] - 12.07.1998, (13); *Avenula pratensis*: [PLM1] - 23.10.1999, (592); *A. pubescens*: [PC13] - 28.11.1999, (27); 27.12.1999, (12); 29.01.2000, (12); 28.02.2000, (47); *Bromus carinatus*: [BRP2] - 15.07.1998, (33); [KAT1] - 18.10.1998, (108); *B. erectus*: [PC13b] - 23.05.1999, (23); 30.07.1999, (300); 31.08.1999, (352); 23.09.1999, (375); 28.11.1999, (162); 27.12.1999, (270); 29.01.2000, (222); 28.02.2000, (51); 29.03.2000, (31); *B. hordaceus*: [BRP1] - 15.07.1998, (17); [PC7] - 25.02.1999, (34); [PC13a] - 30.10.1999, (30); [GLD2] - 23.04.2000, (40); *B. inermis*: [PBP1] - 19.08.1998, (13), [PBP7] - 19.08.1998, (84); [PBP3] - 16.10.1999, (74), leg. TR; [PLM1] - 20.06.1999, (83); [PLM12] - 30.04.1999, (22); 20.06.1999, (5); 31.08.1999, (2684); 23.09.1999, (55); 23.10.1999, (3021); 28.11.1999, (175); 22.01.2000, (192); 29.02.2000, (281); 29.03.2000, (115); [PLM17] - 23.05.1999, (80); [PC6] - 20.06.1999, (29); 27.12.1999, (149); [PC13] - 13.04.1999, (228); 23.05.1999, (1639); 31.08.1999, (721); 23.09.1999, (930); 30.10.1999, (4414); 28.11.1999, (1665); 27.12.1999, (269); 29.01.2000, (391); 28.02.2000, (54); 29.03.2000, (16); *B. sterilis*: [PC16] - 23.05.1999, (14); 13.04.1999, (23); [PC7] - 23.05.1999, (35); [PLM10] - 23.05.1999, (79); *Calamagrostis epigeios*: [PLM2] - 23.05.1999, (4); *Corynephorus canescens*: [ME1] - 21.07.1999, (39); *Dactylis glomerata*: [PLM3] - 20.06.1999, (57); 30.07.1999, (516); 31.08.1999, (1646); 23.09.1999, (1172); 23.10.1999, (1573); 28.11.1999, (2266); 27.12.1999, (689); 22.01.2000, (195); 29.02.2000, (61); 29.03.2000, (44); [PLM2a] - 20.06.1999, (43); [PLM11] - 23.09.1999, (150); [PLM12] - 23.09.1999, (247); [PC13] - 30.07.1999, (22); 31.08.1999, (1205); [PC6] - 30.10.1999, (11); *Elymus arenarius*: [ME1] - 21.07.1999, (469); *Festuca arundinacea*: [SWC1] - 18.02.1999, (16); 21.05.1999, (20); 24.06.1999, (38); 27.07.1999, (459); [PLM1] - 30.04.1999, (37); [PC6] - 30.07.1999, (75); [PC13a] - 27.12.1999, (272); [PC16a] - 30.10.1999, (44); 29.01.2000, (95); [BIA1] - 01.05.2000, (43); *F. pratensis*: [SLG1] - 12.07.1998, (67); [SWC1] - 18.02.1999, (40); 20.04.1999, (48); 21.05.1999, (25); *F. ovina*: [SWC1] - 27.07.1999, (53); *F. rubra*: [BRP1] - 15.07.1998, (46); [WPN1] - 07.03.1999, (18); [SWC] - 25.03.1999, (23); 21.05.1999, (18); 24.06.1999, (90); 27.07.1999, (228); [SWC1] - 21.05.1999, (46); 24.06.1999, (80); 27.07.1999,

(174); [OP3] - 19.06.1999, (108); [PC8] - 25.02.1999, (40); [PC5] - 25.02.1999, (36); 25.02.1999, (20); 28.02.2000, (87); [PC16] - 29.01.2000, (259); [PLM1] - 30.04.1999, (64); [PLM2] - 23.10.1999, (70); [PLM3] - 30.07.1999, (13); [PLM10]

Table 9

Parameters of infestation of *Abacarus hystrix*. For legend see Table 2.

| Host species | *n* | *k* | *P* | *LCI* | *UCI* | *I* | *LCI* | *UCI* | *D* | *LCI* | *UCI* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. *Agropyron cristatum** | 5 | 3 | 60.0 | 14.7 | 94.7 | 13.0 | 2.7 | 29.0 | 7.8 | 1.6 | 17.4 |
| 2. *Agropyron repens** | 885 | 554 | 62.6 | 59.3 | 65.8 | 109.6 | 95.0 | 127.4 | 68.6 | 59.5 | 79.7 |
| 3. *Agrostis gigantea*** | 55 | 4 | 7.3 | 2.0 | 17.6 | 22.0 | 6.3 | 50.8 | 1.6 | 0.5 | 3.7 |
| 4. *Alopecurus pratensis**** | 70 | 8 | 11.4 | 5.1 | 21.3 | 4.6 | 1.8 | 12.4 | 0.5 | 0.2 | 1.4 |
| 5. *Apera spica-venti**** | 61 | 3 | 4.9 | 1.0 | 13.7 | 2.3 | 0.0 | 6.0 | 0.1 | 0.0 | 0.3 |
| 6. *Arrhenantherum elatius**** | 496 | 27 | 5.4 | 3.6 | 7.8 | 14.7 | 8.8 | 25.2 | 0.8 | 0.5 | 1.4 |
| 7. *Avena sativa**** | 24 | 1 | 4.2 | 0.1 | 21.1 | - | - | - | 0.5 | 0.0 | 1.6 |
| 8. *Avenula pratensis** | 15 | 10 | 66.7 | 38.4 | 88.2 | 59.2 | 26.3 | 114.3 | 39.5 | 17.5 | 76.2 |
| 9. *Avenula pubescens*** | 60 | 14 | 23.3 | 13.4 | 36.0 | 7.0 | 3.3 | 17.2 | 1.6 | 0.8 | 4.0 |
| 10. *Bromus carinatus** | 20 | 4 | 20.0 | 5.7 | 43.7 | 35.3 | 8.3 | 91.0 | 7.1 | 1.7 | 18.2 |
| 11. *Bromus erectus** | 120 | 64 | 53.3 | 44.0 | 62.5 | 27.9 | 20.8 | 37.3 | 14.9 | 11.1 | 19.9 |
| 12. *Bromus hordaceus**** | 166 | 13 | 7.8 | 4.2 | 13.0 | 9.3 | 4.8 | 17.7 | 0.7 | 0.4 | 1.4 |
| 13. *Bromus inermis** | 401 | 176 | 43.9 | 39.0 | 48.9 | 98.8 | 75.1 | 134.2 | 43.4 | 33.0 | 58.9 |
| 14. *Bromus sterilis*** | 75 | 14 | 18.7 | 10.6 | 29.3 | 10.8 | 5.8 | 21.0 | 2.0 | 1.1 | 3.9 |
| 15. *Calamagrostis epigeios**** | 397 | 1 | 0.3 | 0.0 | 1.4 | - | - | - | 0.0 | 0.0 | 0.0 |
| 16. *Corynephorus canescens**** | 10 | 5 | 50.0 | 18.7 | 81.3 | 7.8 | 2.4 | 16.2 | 3.9 | 1.2 | 8.1 |
| 17. *Dactylis glomerata** | 541 | 128 | 23.7 | 20.1 | 27.5 | 77.3 | 59.3 | 100.1 | 18.3 | 14.0 | 23.7 |
| 18. *Elumus arenarius** | 15 | 5 | 33.3 | 11.8 | 61.6 | 93.8 | 35.2 | 179.4 | 31.3 | 11.7 | 59.8 |
| 19. *Festuca arundinacea** | 165 | 57 | 34.5 | 27.3 | 42.3 | 19.3 | 13.4 | 27.9 | 6.7 | 4.6 | 9.6 |
| 20. *Festuca ovina*** | 45 | 8 | 17.8 | 8.0 | 32.1 | 6.6 | 2.5 | 18.0 | 1.2 | 0.4 | 3.2 |
| 21. *Festuca pratensis*** | 65 | 7 | 10.8 | 4.4 | 20.9 | 25.7 | 9.4 | 63.7 | 2.8 | 1.0 | 6.9 |
| 22. *Festuca rubra*** | 682 | 111 | 16.3 | 13.6 | 19.3 | 15.7 | 12.1 | 20.5 | 2.6 | 2.0 | 3.3 |
| 23. *Festulolium adscendens**** | 50 | 14 | 28.0 | 16.2 | 42.5 | 17.1 | 9.5 | 29.3 | 4.8 | 2.7 | 8.2 |
| 24. *Holcus lanatus**** | 56 | 11 | 19.6 | 10.2 | 32.4 | 6.2 | 2.5 | 14.8 | 1.2 | 0.5 | 2.9 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 25. *Hordeum murinum** | 5 | 1 | 20.0 | 0.5 | 71.6 | - | - | - | 10.6 | 0.0 | 21.2 |
| 26. *Hordeum vulgare*** | 41 | 9 | 22.0 | 10.6 | 37.6 | 23.6 | 10.4 | 43.3 | 5.2 | 2.3 | 9.5 |
| 27. *Lolium hybridum**** | 30 | 3 | 10.0 | 2.1 | 26.5 | 9.3 | 1.7 | 25.0 | 0.9 | 0.2 | 2.5 |
| 28. *Lolium perenne** | 258 | 141 | 54.7 | 48.4 | 60.8 | 60.8 | 50.5 | 73.1 | 33.2 | 27.6 | 40.0 |
| 29. *Melica nutans*** | 11 | 6 | 54.5 | 23.4 | 83.3 | 8.8 | 3.3 | 18.0 | 4.8 | 1.8 | 9.8 |
| 30. *Melica uniflora*** | 21 | 3 | 14.3 | 3.0 | 36.3 | 13.0 | 2.0 | 37.0 | 1.9 | 0.3 | 5.3 |
| 31. *Phleum pratense**** | 110 | 2 | 1.8 | 0.2 | 6.4 | 4.5 | 0.0 | 18.0 | 0.1 | 0.0 | 0.3 |
| 32. *Poa annua*** | 35 | 3 | 8.6 | 1.8 | 23.1 | 17.3 | 3.7 | 47.7 | 1.5 | 0.3 | 4.1 |
| 33. *Poa pratensis*** | 265 | 34 | 12.8 | 9.1 | 17.5 | 32.1 | 17.0 | 64.4 | 4.1 | 2.2 | 8.3 |
| 34. *Puccinellia distans*** | 81 | 11 | 13.6 | 7.0 | 23.0 | 7.0 | 3.4 | 13.6 | 1.0 | 0.5 | 1.9 |
| 35. *Sesleria varia** | 5 | 5 | 100.0 | 47.8 | 100.0 | 11.2 | 3.2 | 23.2 | 11.2 | 3.2 | 23.2 |
| 36. *Triticale rimpaui*** | 30 | 4 | 13.3 | 3.8 | 30.7 | 20.8 | 6.0 | 56.5 | 2.8 | 0.8 | 7.5 |
| 37. *Triticum aestivum**** | 420 | 69 | 16.4 | 13.0 | 20.3 | 21.2 | 14.0 | 34.2 | 3.5 | 2.3 | 5.6 |

- 23.05.1999, (212); [MOG3] - 4.04.1999, (15); [GLD1] - 04.04.1999, (29); [ME1] - 21.07.1999, (44); [BWP] - 30.01.2000, (21); *Festulolium adscendens*: [SWC1] - 21.05.1999, (113); 24.06.1999, (76); 27.07.1999, (51); *Holcus lanatus*: [PLM2] - 23.09.1999, (19); [PLM2a] - 23.05.1999, (22); 31.08.1999, (27); *Hordeum murinum*: [POP] - 01.08.1998, (53); *H. vulgare*: [SLG1] - 12.07.1998, (29); [KUG2] - 12.07.1998, (55); [TRP1] - 17.06.1999, (128), leg. ASu; *Lolium hybridum*: [SWC1] - 21.05.1999, (28); *L. perenne*: [BRP1] - 15.07.1998, (57); [PBP1] - 19.08.1998, (104); [SWC1] - 21.05.1999, (140); 24.06.1999, (316); 27.07.1999, (290); [PM1] - 11.01.1999, (418); [POP] - 04.01.1999, (518); [PLM3] - 20.06.1999, (333); 30.07.1999, (674); [PLM10] - 30.04.1999, (126); 23.09.1999, (1196); 23.10.1999, (1096); 28.11.1999, (1422); [PLM12] - 23.05.1999, (446); [PC13] - 23.09.1999, (216); 30.10.1999, (168); 28.11.1999, (164); [PC13a] - 31.08.1999, (737); [LGW1] - 14.06.1999, (88); [KA1] - 25.10.1999; (62); *Melica nutans*: [PWH] - 24.08.1999, (53); *M. uniflora*: [DPN] - 18.05.2000, (39); *Phleum pratense*: [PWA] - 08.08.1999, (9); *Poa annua*: [BRP1] - 15.07.1998, (36); [POP] - 25.10.1998, (16); *P. pratensis*: [GLD1] - 23.04.2000, (118); [PLM2] - 22.01.2000, (84); [PLM2a] - 30.04.1999, (46); [PLM17] - 30.07.1999, (96); [SWC1] - 27.07.1999, (746); *Puccinellia distans*: [LUP] - 25.08.1999, (5), leg. ML; [INJ] - 16.05.2000, (7), leg. ML; [IND] - 16.05.2000, (16), leg. ML; [INJA2] - 16.05.2000, (41), leg. ML; [GOI] - 16.05.2000, (8), leg. ML; *Sesleria varia*: [PWH] - 24.08.1999, (56); *Triticale rimpaui*: [TRP1] - 17.06.1999, (83), leg. ASu; *Triticum aestivum*: [KUG3] - 12.07.1998, (34); [MOG2] - 26.07.1998, (97); [ZAD2] - 04.08.1998, (39); [SWC1] - 01.06.2000, (8), leg. AS&WM; 16.06.2000,

(181); 02.07.2000, (365); 01.06.2001, (4); 15.06.2001, (2); 01.07.2000, (2), leg. AS&WM; 13.07.2001, (120), leg. AS&WM; [CHK2] - 16.06.2000, (21), leg. AS&WM; 02.07.2000, (114), leg. AS&WM; 01.06.2001, (14); 15.06.2001, (9); 13.07.2001, (455).

ECOLOGICAL NOTES

Generalist with 12 specific hosts, 17 accessory hosts, eight accidental hosts (Table 9; Figs 61-63)

GENERAL DISTRIBUTION

Holarctic, Ethopian and Australian Regions. The species so far was recorded in Australia, Austria, Bulgaria, England, Finland, Germany, Hungary, New Zealand, Northern Ireland, Poland, South Africa, Sweden, USA (California, Georgia, Minnesota, Nebraska, South Dakota, Virginia, West Virginia), Russia (Siberia), Mongolia, Yugoslavia on at least 40 species of grasses (AMRINE & STASNY 1994; SKORACKA et al. 2001). In Poland the species was previously recorded in the Wielkopolska region, the Upper Silesia region and Warsaw from about 40 species of grasses (BOCZEK et al. 1976; SKORACKA & BOCZEK 2000a; KOZŁOWSKI 2002; SKORACKA & KOZŁOWSKI 2002).

### *Abacarus longilobus* SKORACKA, 2002

DESCRIPTION

Complete description in SKORACKA (2002)

Female (n=10) (Figs 64-65): Body spindleform with dorsomedian ridge narrow and ending near 16th dorsal annulus from the end of body, dorsal furrow and lateral ridges ending near 6-7th annulus from end. Body length 185-296; width 57-67. Gnathosoma 22-30 long; chelicerae 19-23 long.

Prodorsal shield: 47-57 long, 44-52 wide. Elongate triangularly- rhomboidal, with pronounced lobe over gnathosoma. Sculpture: median line absent; admedian lines on rear half of shield, parallel to each other; II submedian lines entire on anterior half of shield, on rear half consist of dashes. Setae *sc* 8-12 long, 27-31 apart, projecting to rear.

Coxae: numerous lines and dashes, some lines with microtubercles. Sternal line slender.

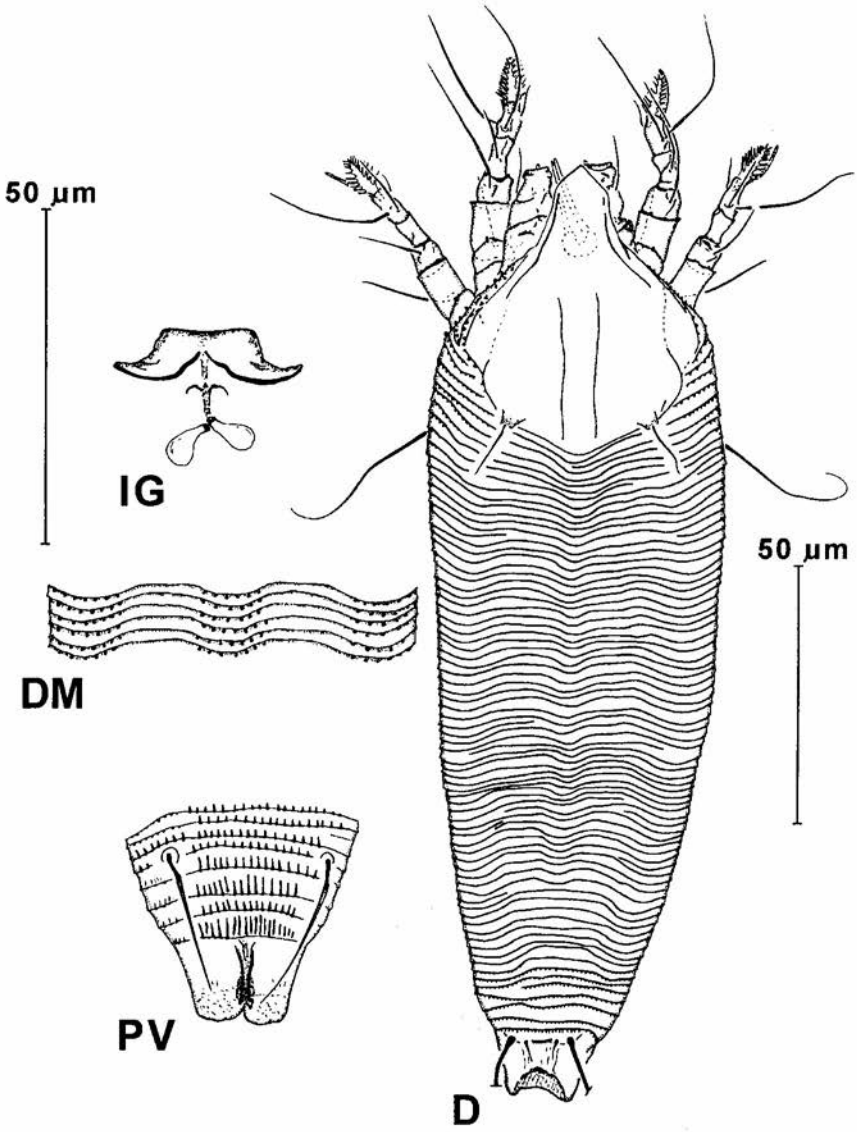
Opisthosoma with 66-74 dorsal annuli, 68-81 ventral annuli, 5-7 coxigenital annuli. Annuli with microtubercles set along annuli margins: dorsal bead-like, present only on ridges; ventral minute, conical and pointed.

Leg I: 36-46; femur 10-11, seta *bv* 12-15; genu 6-7, seta *l''* 22-30; tibia 8-9, seta *l'* 10-12; tarsus 8-9; solenidion $\omega$ 9-10; empodium 10-12, simple, 8-9-rayed, symmetrical.

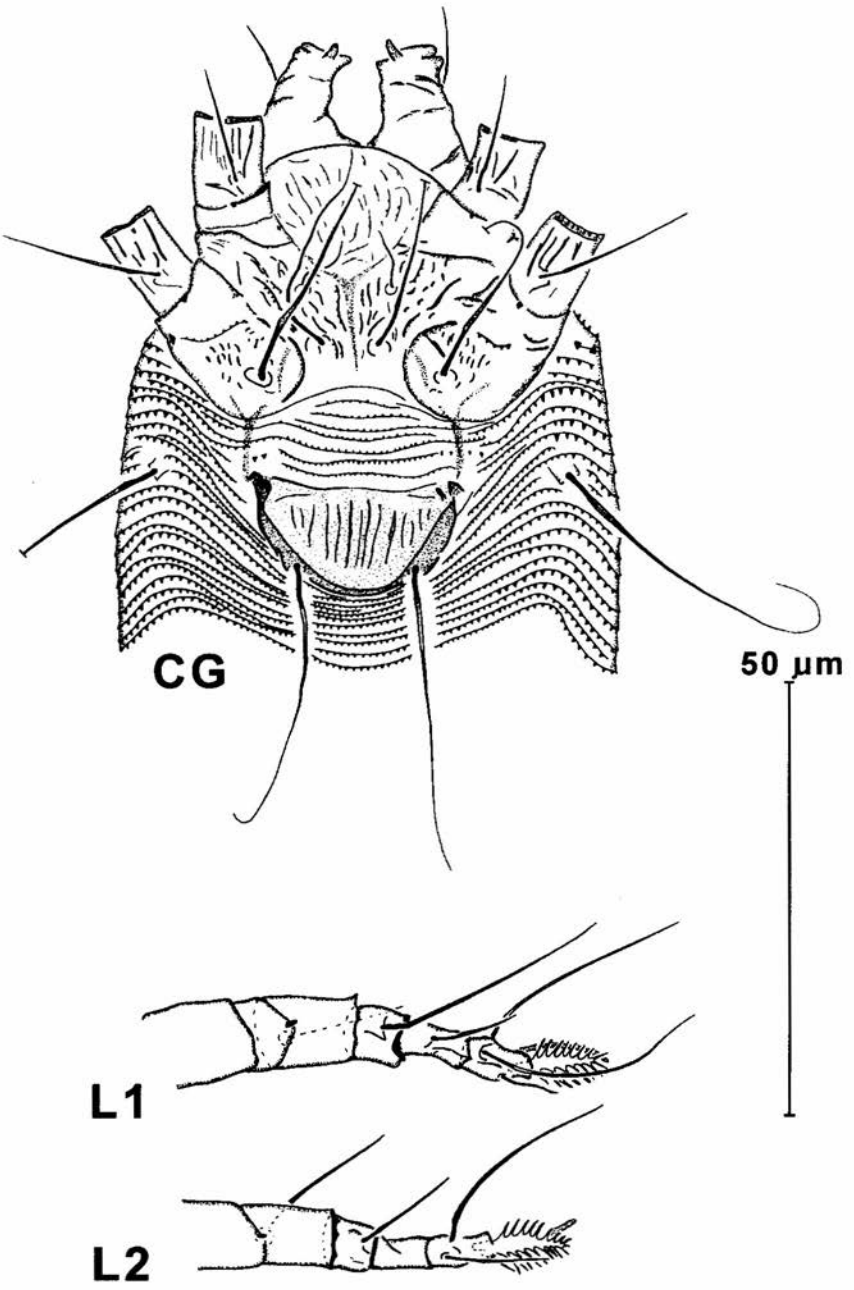
Leg II: 36-41; femur 10-12, *bv* 14-21; genu 5-6, *l''* 12-17; tibia 6-7; tarsus 8-9; solenidion $\omega$ 10-11; empodium 10-12, 8-9-rayed, symmetrical.

Genital parts 16-19 long, 23-27 wide, genital coverflap with 10-12 longitudinal ribs.

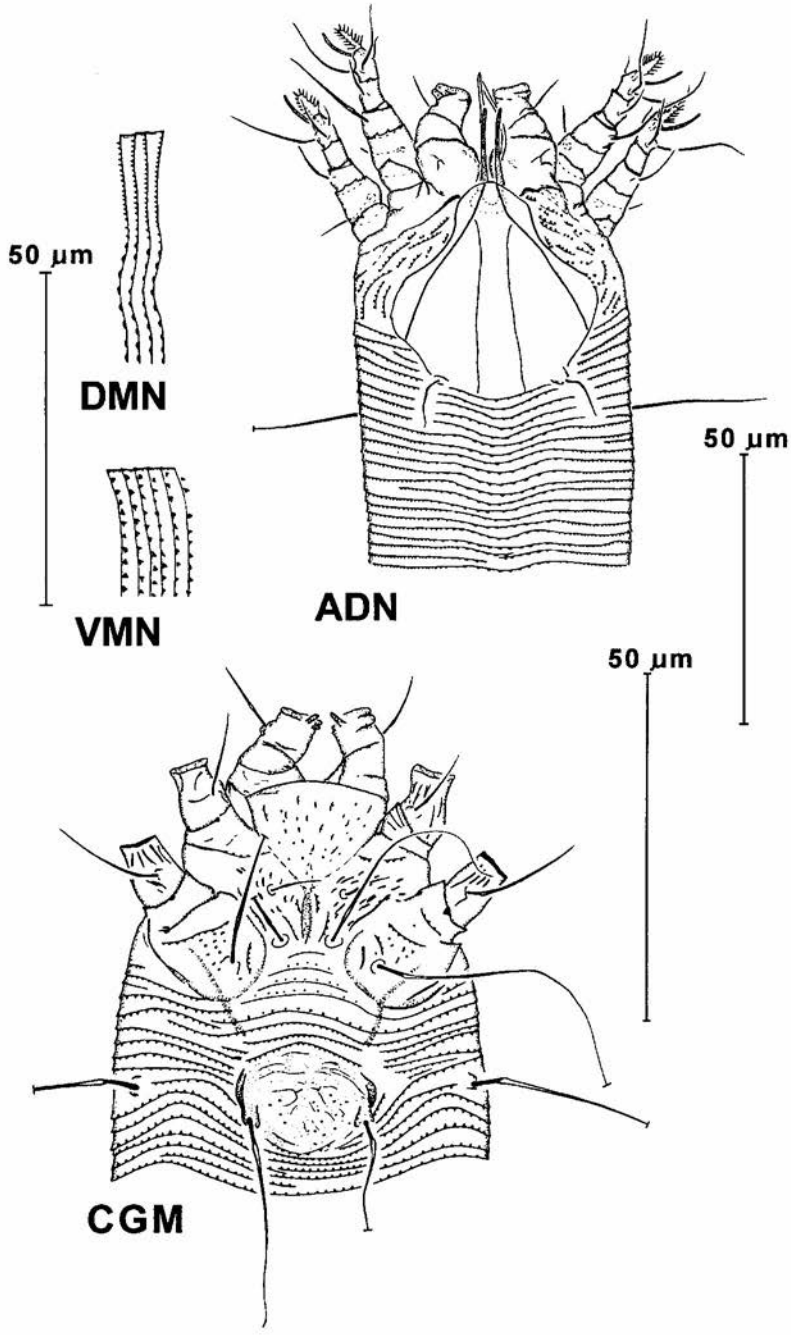
Length of setae: pedipalpal: *d* 10-12; *v* 2-3; *ep* 3; coxal: *1b* 11-13; *1a* 24-29; *2a* 46-53; opisthosomal: *c2* 38-48; *d* 43-67; *e* 36-48; *f* 25-42; *h1* 4-6; *h2* 72-98; *3a* 30-43.




64. *Abacarus longilobus* SKORACKA, female: D – dorsal aspect, DM – dorsal microtubercles, IG – internal genitalia, PV – posterior telosome




65. *Abacarus longilobus* SKORACKA, female: CG – coxigenital region, L1, L2 – legs I and II




66. *Abacarus longilobus* SKORACKA: ADN – antero-dorsal aspect of nymph, CGM – coxigenital region of male, DMN – dorsal microtubercles of nymph, VMN – ventral microtubercles of nymph

Distance between tubercles bearing coxal setae: *1b* 10-12; *1a* 7-9; *2a* 22-27; *1b* and *1a* 7-8; *1a* and *2a* 8-10.

Male (n=10): Body spindleform with dorsomedian ridge shorter than in female. Body length 178-221; width 46-60. Gnathosoma 17-26 long; chelicerae 17-23 long.

Prodorsal shield: 46-49 long, 38-46 wide. Shape and sculpture of prodorsal shield similar to that of female, with one exception: anterior lobe reaching half of gnathosoma in some specimens has 1-2 spines. Setae *sc* 9-11 long, 24-31 apart, projecting to rear.

Coxae: with a pattern of lines and microtubercles on coxae I, dashes on coxae II. Sternal line slender (Fig. 66).

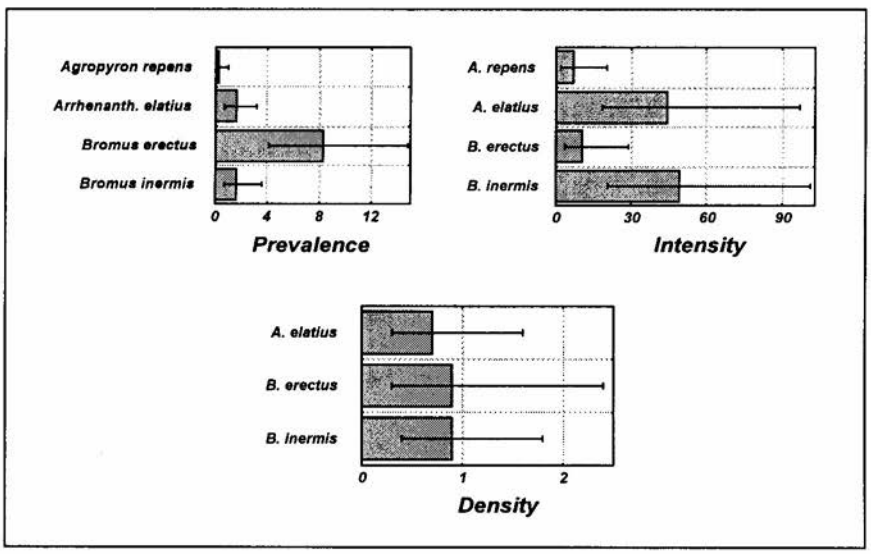
Opisthosoma with 57-65 dorsal annuli, 58-69 ventral annuli, 5-7 coxigenital annuli. Annuli with microtubercles similar to that of female.

Leg I: 32-37; femur 8-10, seta *bv* 8-14; genu 5-6, seta *l"* 20-29; tibia 6-8, seta *l'* 8-10; tarsus 7-8; solenidion $\omega$ 8-10; empodium 9-11, simple, 7-8-rayed, symmetrical.

Leg II: 31-35; femur 9-10, *bv* 15-18; genu 4-5, *l"* 10-15; tibia 5-7; tarsus 7; solenidion $\omega$ 8 10; empodium 9-10, 7-8-rayed, symmetrical.

Genital parts 14-17 long, 19-21 wide, surface below eugenital setae with few conical, not pointed microtubercles (Fig. 66).

Length of setae: pedipalpal: *d* 8-10; *v* 2; *ep* 2-3 coxal: *1b* 7-10; *1a* 19-29; *2a* 40-52; opisthosomal: *c2* 36-48; *d* 62-67; *e* 24-40; *f* 27-41; *h1* 4-5; *h2* 67-81; *3a* 26-32.




67. Prevalence, intensity and density of infestation of *Abacarus longilobus* on grass species. Explanation of abbreviation: "*Arrhenanth.*" – *Arrhenantherum*

Nymph (n=6) (Fig. 66): Body spindleform with dorsomedian ridge slender, ending near 6-7th annulus from end. Body length 162-206; width 44-60. Gnathosoma 16-26 long; chelicerae 17-20 long.

Prodorsal shield: 37-41 long, 35-44 wide. Triangularly-oval with elongated lobe over base of chelicerae. Sculpture: median line absent; admedian lines complete, parallel to each other; submedian lines subparallel to lateral margins of shield. Setae *sc* 7-10 long, 22-26 apart, projecting to rear.

Coxae: short, slender lines and conical microtuberlces.

Opisthosoma with 44-63 dorsal annuli, 45-60 ventral annuli, 7-8 coxigenital annuli. Annuli with microtubercles set along annuli margins: dorsal bead-like and sparse on ridge, conical and pointed near ridge; ventral conical and larger than dorsal.

Leg I: 27-35; femur 6-9, seta *bv* 7-9; genu 4-5, seta *l''* 18-25; tibia 5-6, seta *l'* 7-10; tarsus 5-6; solenidion $\omega$ 6-8; empodium 7-9, simple, 6-7-rayed, symmetrical.

Leg II: 23-32; femur 6-8, *bv* 11-13; genu 4-5, *l''* 8-10; tibia 3-4; tarsus 5-6; solenidion $\omega$ 6-9; empodium 7-9, 6-7-rayed, symmetrical.

Length of setae: pedipalpal: *d* 6-8; *v* 2; *ep* 3; coxal: *1b* 6; *2a* 30-35; opisthosomal: *c2* 24-34; *d* 29-38; *e* 10-25; *f* 19-27; *h1* 2-4; *3a* 8-13.

Larva not found.

HOST PLANT

*Bromus inermis* LEYSS. Relation to host plant: vagrant on both leaf surfaces; no visible damages.

MATERIAL

19 females, 14 males, 17 nymphs from Poznań, Cytadela, scarp with south exposition [PC13], 20.06.1999, leg. AS.

Other records: *Agropyron repens*: [PC13] - 30.07.1999, (22); *Arrhenantherum elatius*: [PC13] - 20.06.1999, (356); *Bromus erectus*: [PC13b] - 20.06.1999, (108).

Table 10

Parameters of infestation of *Abacarus longilobus*. For legend see Table 2.

| Host species | n | k | P | LCI | UCI | I | LCI | UCI | D | LCI | UCI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. *Agropyron repens**** | 885 | 3 | 0.3 | 0.1 | 1.0 | 7.3 | 2.0 | 20.3 | 0.0 | 0.0 | 0.1 |
| 2. *Arrhenantherum elatius**** | 496 | 8 | 1.6 | 0.7 | 3.2 | 44.5 | 18.5 | 97.0 | 0.7 | 0.3 | 1.6 |
| 3. *Bromus erectus**** | 120 | 10 | 8.3 | 4.1 | 14.8 | 10.8 | 3.6 | 28.9 | 0.9 | 0.3 | 2.4 |
| 4. *Bromus inermis**** | 401 | 7 | 1.7 | 0.7 | 3.6 | 49.6 | 20.7 | 101.3 | 0.9 | 0.4 | 1.8 |

ECOLOGICAL NOTES

*A. longilobus* was found on four host species, however each of them was accidental for this mite species (Table 10; Fig. 67).

GENERAL DISTRIBUTION

Palearctic Region. The species so far was recorded in Poland (SKORACKA 2002).

### *Abacarus tucholensis* SKORACKA, 2001

DESCRIPTION

Complete description in SKORACKA (2001)

Female (n=14) (Figs 68-69): Body spindleform with dorsomedian ridge short. Body length 190-277; width 54-59. Gnathosoma 23-31 long; chelicerae 22-30 long.

Prodorsal shield: 48-54 long, 40-52 wide. Elongate-triangular, with pronounced, pointed lobe over gnathosoma. Sculpture: median line on rear half of shield, in some specimens divided into two lines; admedian lines complete, parallel to each other, diverging near rear margin of shield; submedian lines begining near base of anterior lobe or connecting with admedian lines, parallel to lateral margins of shield. Setae *sc* 20-29 long, 27-31 apart, projecting to rear.

Coxae: with a pattern of numerous, short, slender lines; Sternal line distinct.

Opisthosoma with 54-60 dorsal annuli, 67-75 ventral annuli, 7-9 coxigenital annuli. Annuli with microtubercles set along annuli margins: dorsal large, irregular: sparse and subrounded on the ridge and furrows, while on lateral side of body smaller and more numerous, near end of furrow pointed; ventral minute, pointed.

Leg I: 31-43; femur 8-11, seta *bv* 12-19; genu 5-7, seta *l''* 24-29; tibia 8-9, seta *l'* 9-12; tarsus 7-8; solenidion $\omega$ 9-11, knobed; empodium 10-12, simple, 7-rayed, symmetrical.

Leg II: 30-36; femur 8-11, *bv* 19-27; genu 5-6, *l''* 14-18; tibia 7-8; tarsus 7-8; solenidion $\omega$ 9 11, knobed; empodium 10-11, 7-rayed, symmetrical.

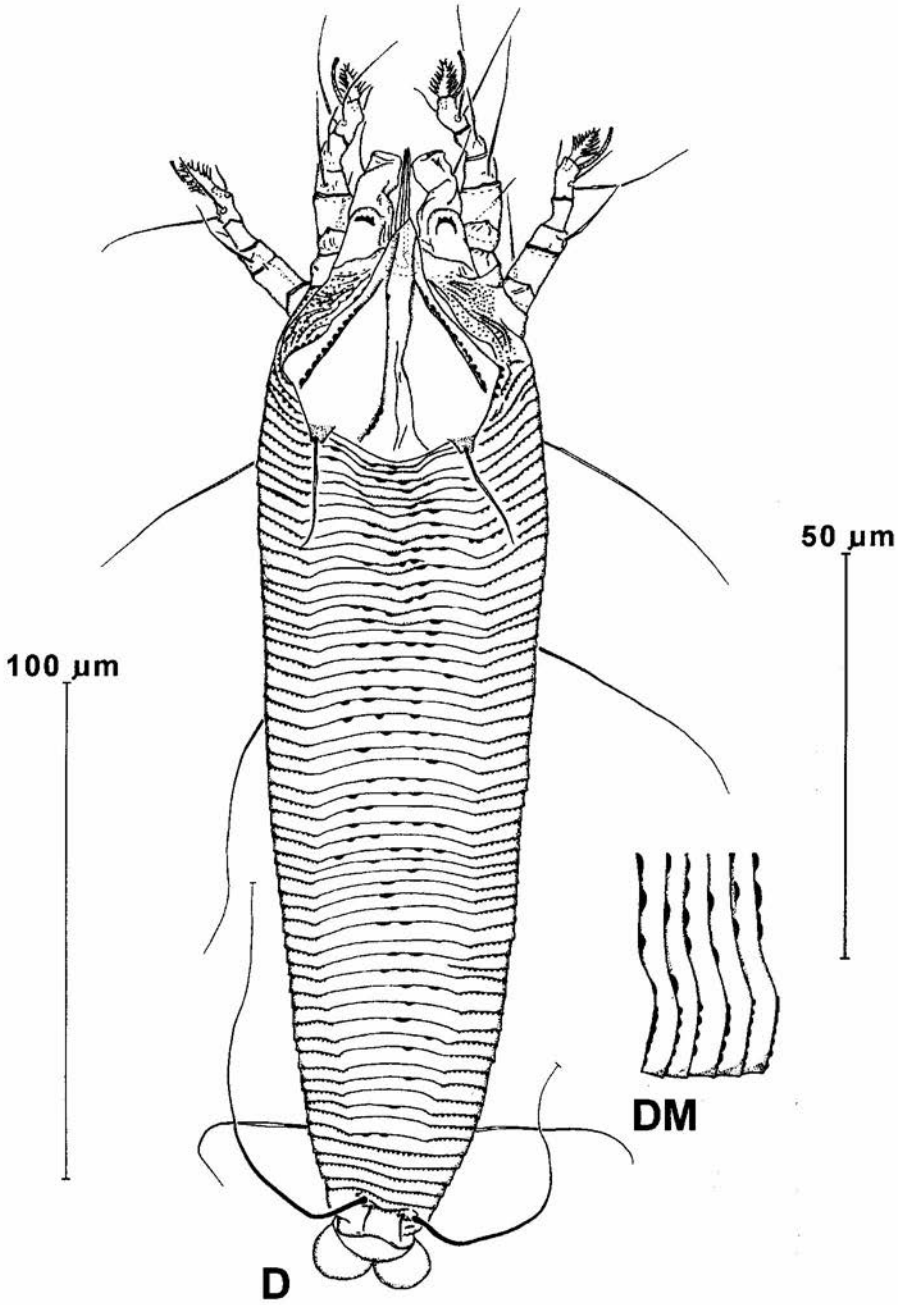
Genital parts 15-18 long, 21-24 wide, genital coverflap with 12-17 longitudinal ribs.

Length of setae: pedipalpal: *d* 10-11; *v* 2-3; *ep* 4; coxal: *1b* 8-14; *1a* 18-34; *2a* 33-53; opisthosomal: *c2* 31-46; *d* 37-76; *e* 22-38; *f* 29-38; *h1* 4-6; *h2* 66-105; *3a* 28-48.

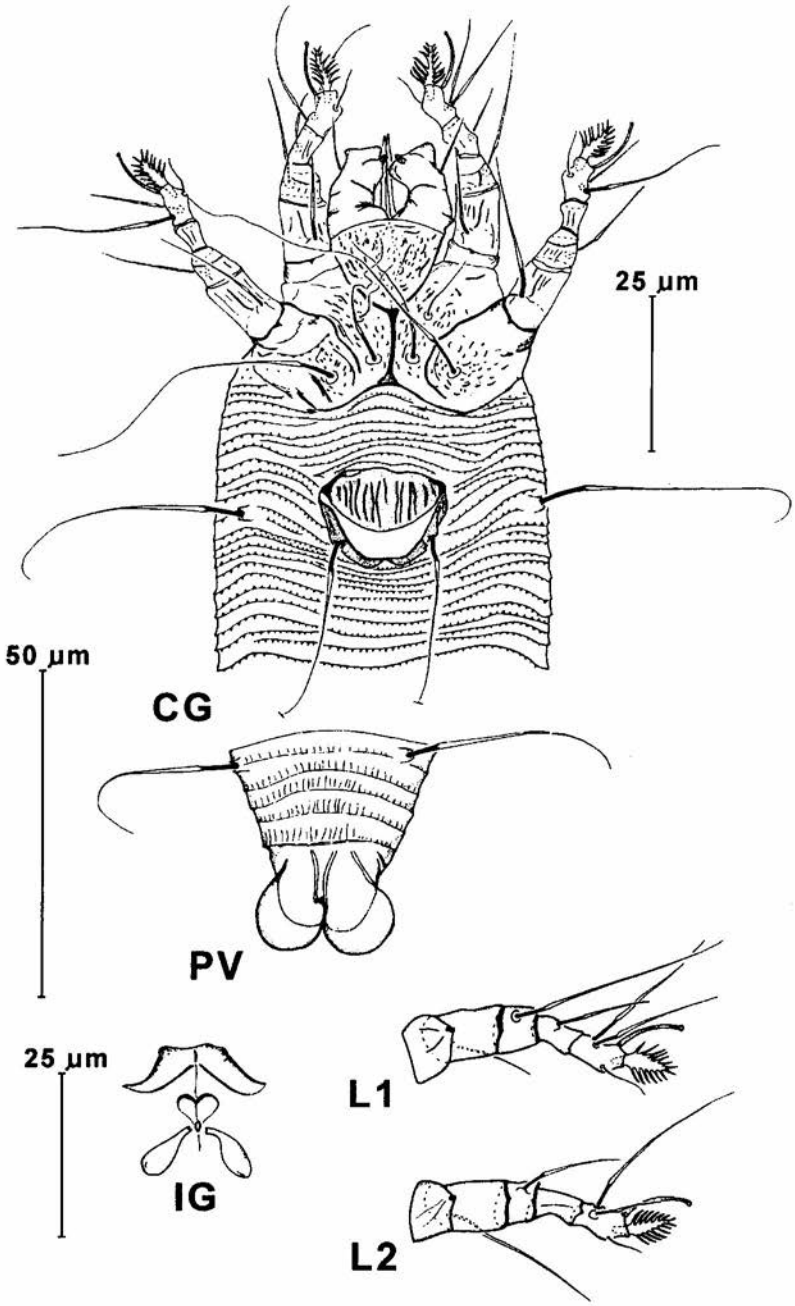
Distance between tubercles bearing coxal setae: *1b* 9-13; *1a* 7-9; *2a* 18-26; *1b* and *1a* 7-9; *1a* and *2a* 7-10.

Male (n=8): Body spindleform with dorsomedian ridge short. Body length 209-243; width 50-55. Gnathosoma 27-29 long; chelicerae 21-28 long.

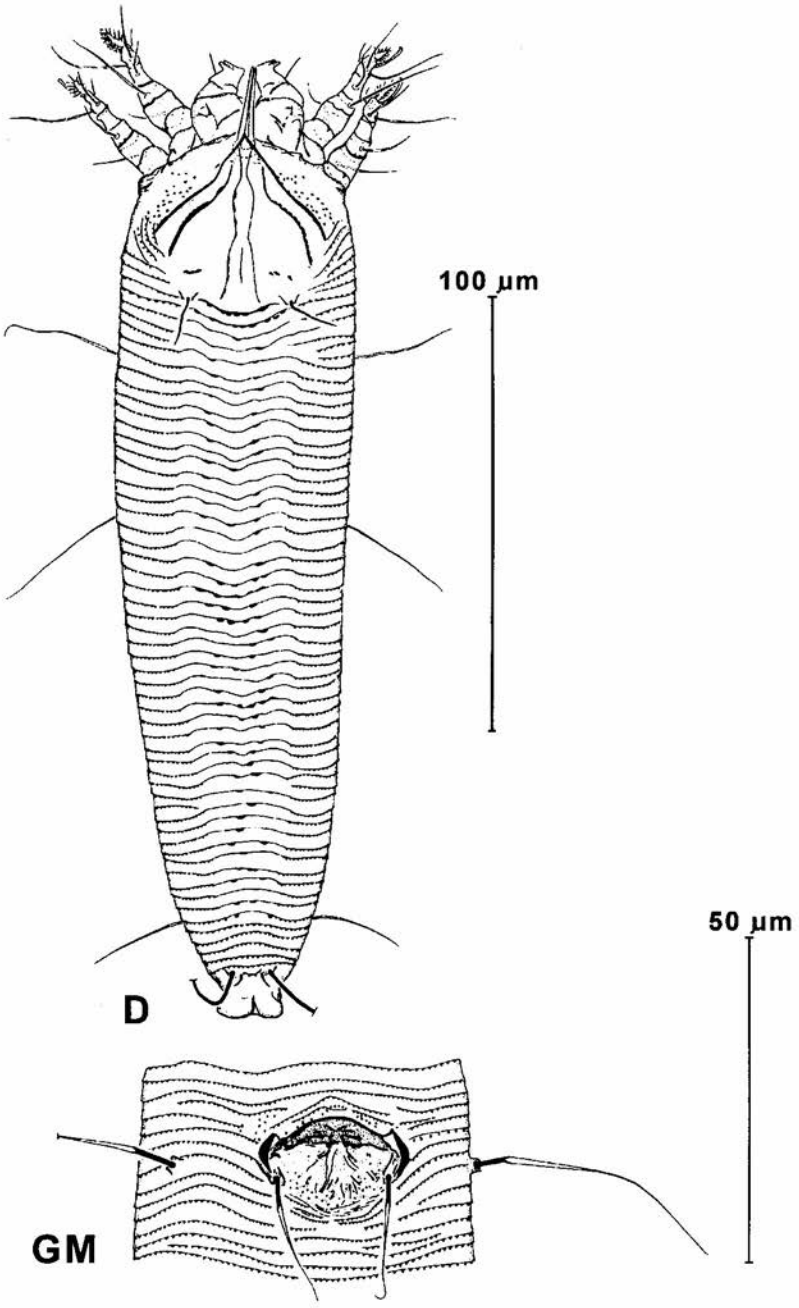
Prodorsal shield: 45-49 long, 40-43 wide. Shape and sculpture similar to that of female. Setae *sc* 21-23 long, 25-28 apart, projecting to rear.




68. *Abacarus tucholensis* SKORACKA, female: D – dorsal aspect, DM – dorsal microtubercles




69. *Abacarus tucholensis* SKORACKA, female: CG – coxigenital region, IG – internal genitalia, L1, L2 – legs I and II, PV – ventral telosome




70. *Abacarus tucholensis* SKORACKA: D – dorsal aspect of nymph, GM – genital region of male

Coxae: with a pattern similar to that of female.

Opisthosoma with 48-53 dorsal annuli, 63-68 ventral annuli, 7-9 coxigenital annuli. Annuli with microtubercles similar to that of female.

Leg I: 29-33; femur 9-10, seta *bv* 11-15; genu 5, seta *l"* 21-25; tibia 7-8, seta *l'* 8-10; tarsus 6-8; solenidion $\omega$ 9-10, knobed; empodium 9-10, simple, 6-7-rayed, symmetrical.

Leg II: 29-32; femur 9-10, *bv* 17-24; genu 5, *l"* 12-17; tibia 6-7; tarsus 7-8; solenidion $\omega$ 10-11, knobed; empodium 9-11, 6-7-rayed, symmetrical.

Genital parts 15-17 long, 21-23 wide, surface below eugenital setae with minute microtubercles (Fig. 70).

Length of setae: pedipalpal: *d* 9-10; *v* 2-3; *ep* 5; coxal: *1b* 8-13; *1a* 24-30; *2a* 28-52; opisthosomal: *c2* 36-43; *d* 48-81; *e* 27-38; *f* 24-35; *h1* 4-6; *h2* 48-75; *3a* 24-38.

Nymph (n=1) (Fig. 70): Body spindleform with short dorsomedian ridge. Body length 193; width 54. Gnathosoma 23 long; chelicerae 25 long.

Prodorsal shield: 38 long, 38 wide. Triangularly-oval with small, pointed lobe over base of chelicerae. Sculpture: median line in rear half of shield,; admedian lines complete, undulated, diverging from each other near the rear margin of shield; submedian lines begining near base of anterior lobe and diverging to lateral margins of shield. Setae *sc* 12 long, 24 apart, projecting to rear.

Coxae: with short, slender lines and spots.

Opisthosoma with 47 dorsal annuli, 55 ventral annuli. Annuli with rounded microtubercles set along annuli margins: those on ridge and furrow are large and flattened.

Leg I: 30; femur 8, seta *bv* 9; genu 4, seta *l"* 22; tibia 5, seta *l'* 8; tarsus 6; solenidion $\omega$ 7, knobed; empodium 8, simple, 6-rayed, symmetrical.

Leg II: 27; femur 7, *bv* 13; genu 4, *l"* 12; tibia 5; tarsus 5; solenidion $\omega$ 7, knobed; empodium 8, 6-rayed, symmetrical.

Length of setae: pedipalpal: *d* 7; *v* 3; coxal: *1a* 13; opisthosomal: *c2* 27; *d* 30; *e* 16; *f* 22; *h1* 4; *3a* 13.

Larva not found

HOST PLANT

*Festuca altissima* ALL. Relation to host plant: vagrant on upper leaf surfaces; no visible damages.

MATERAL

36 females, 20 males, 4 nymphs from "Cisy Staropolskie" Leon Wyczółkowski Reserve in Wierzchlas, Bory Tucholskie, shaded tuft of grass, near yew-tree [WIER], 6.06.2000, leg. JB.

Other records: *F. altissima*: [WIER] - 18.05.2000, (250), leg. JB.

ECOLOGICAL NOTES

Specialist I on *Festuca altissima*, which is specific host for this mite species. The values of infestation ($n$=20; $k$=10): $P$=50.0% (*Cl:* 27.2%-72.8%); $I$=30.9 (*Cl*: 12.1-77.9); $D$=15.4 (*Cl*: 6.1-39.0) specimens per shoot.

GENERAL DISTRIBUTION

Palearctic Region. The species so far was recorded in Poland (SKORACKA 2001).

## *Aculodes* KEIFER, 1966

### *Aculodes calamaabditus* SKORACKA, 2003

DESCRIPTION

Complete description in SKORACKA (2003)

Female (n=15) (Figs 71-72): Body spindleform. Body length 195-287; width 52-71. Gnathosoma 25-30 long; chelicerae 21-27 long.

Prodorsal shield: 43-51 long, 41-47 wide. Elongate-triangular, with pointed lobe over cheliceral base. Sculpture: median line on rear half; admedian lines complete, slightly concave in middle; submedian lines running toward outer tubercles bearing *sc* setae. Setae *sc* 12-28 long, 25-32 apart, projecting to rear.

Coxae: with a pattern of numerous, long lines with minute, conical microtubercles. Sternal line slender.

Opisthosoma with 59-79 dorsal annuli, 63-76 ventral annuli, 4-7 coxigenital annuli. Annuli with microtubercles set along annuli margins: dorsal numerous, minute and subrounded; ventral less numerous than dorsal, conical, not pointed.

Leg I: 35-49; femur 9-12, seta *bv* 11-16; genu 5-7, seta *l"* 18-29; tibia 6-9, seta *l'* 8-11; tarsus 7-9; solenidion $\omega$ 8-10; empodium 9-11, simple, 7-8-rayed, symmetrical.

Leg II: 30-45; femur 9-13, *bv* 15-22; genu 4-6, *l"* 12-19; tibia 5-8; tarsus 7-9; solenidion $\omega$ 7 10; empodium 9-12, 7-8-rayed, symmetrical.

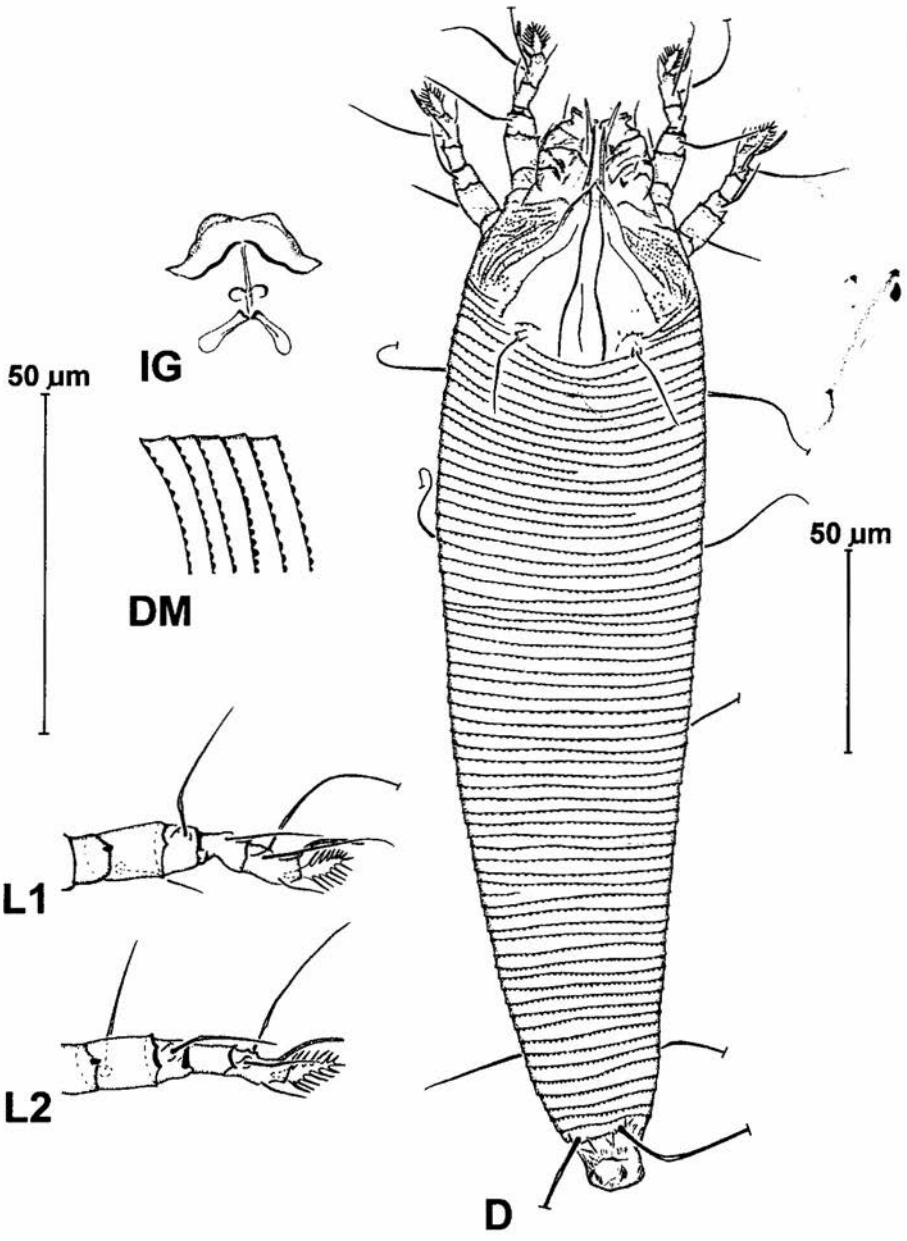
Genital parts 15-18 long, 19-28 wide, genital coverflap with 9-14 longitudinal ribs.

Length of setae: pedipalpal: *d* 7-10; *v* 2-4; *ep* 3-4; coxal: *1b* 10-11; *1a* 20-29; *2a* 48-60; opisthosomal: *c2* 38-41; *d* 62-74; *e* 38-45; *f* 27-35; *h1* 4-6; *h2* 73-88; *3a* 23-35.

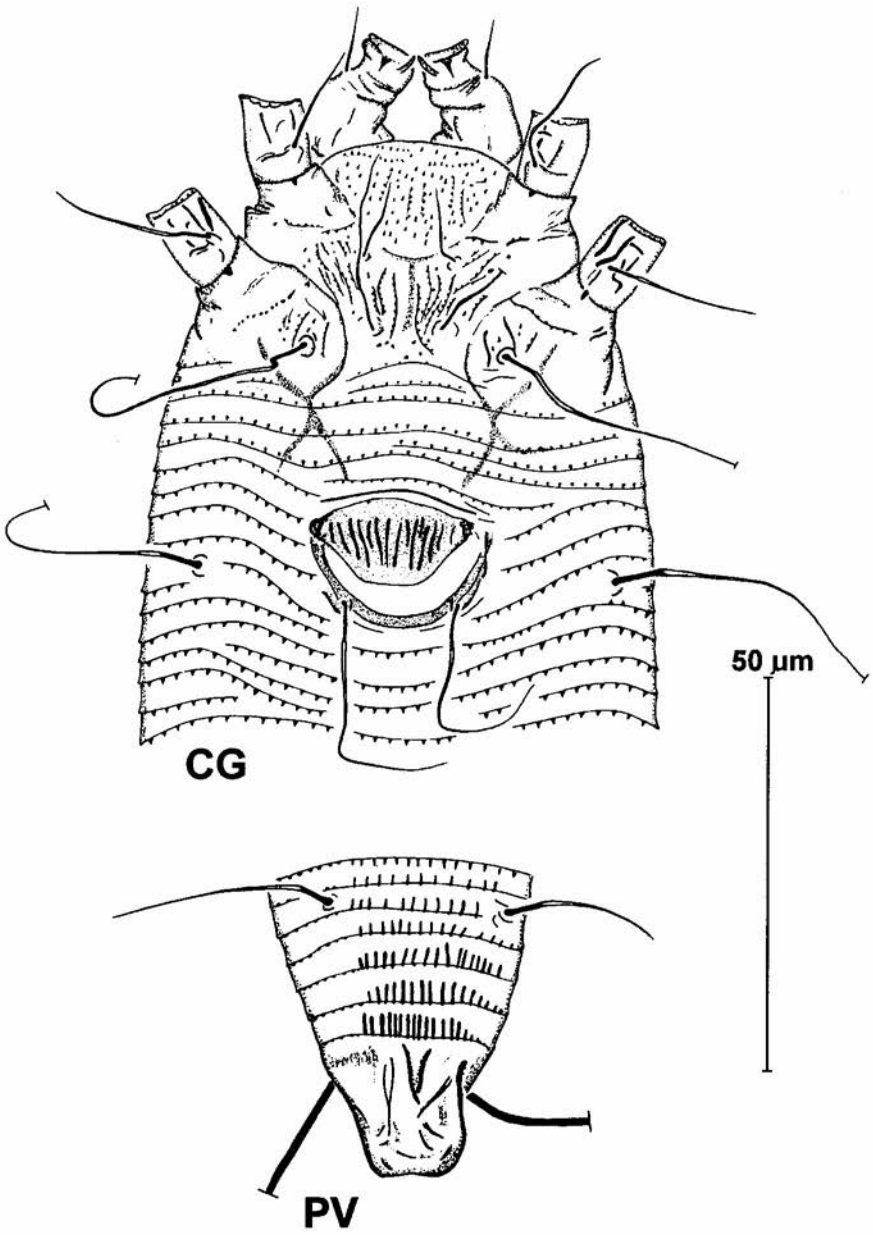
Distance between tubercles bearing coxal setae: *1b* 10-13; *1a* 7-10; *2a* 20-29; *1b* and *1a* 8-11; *1a* and *2a* 8-10.

Male (n=3): Body spindleform. Body length 185; width 47. Gnathosoma 24 long; chelicerae 23-26 long.

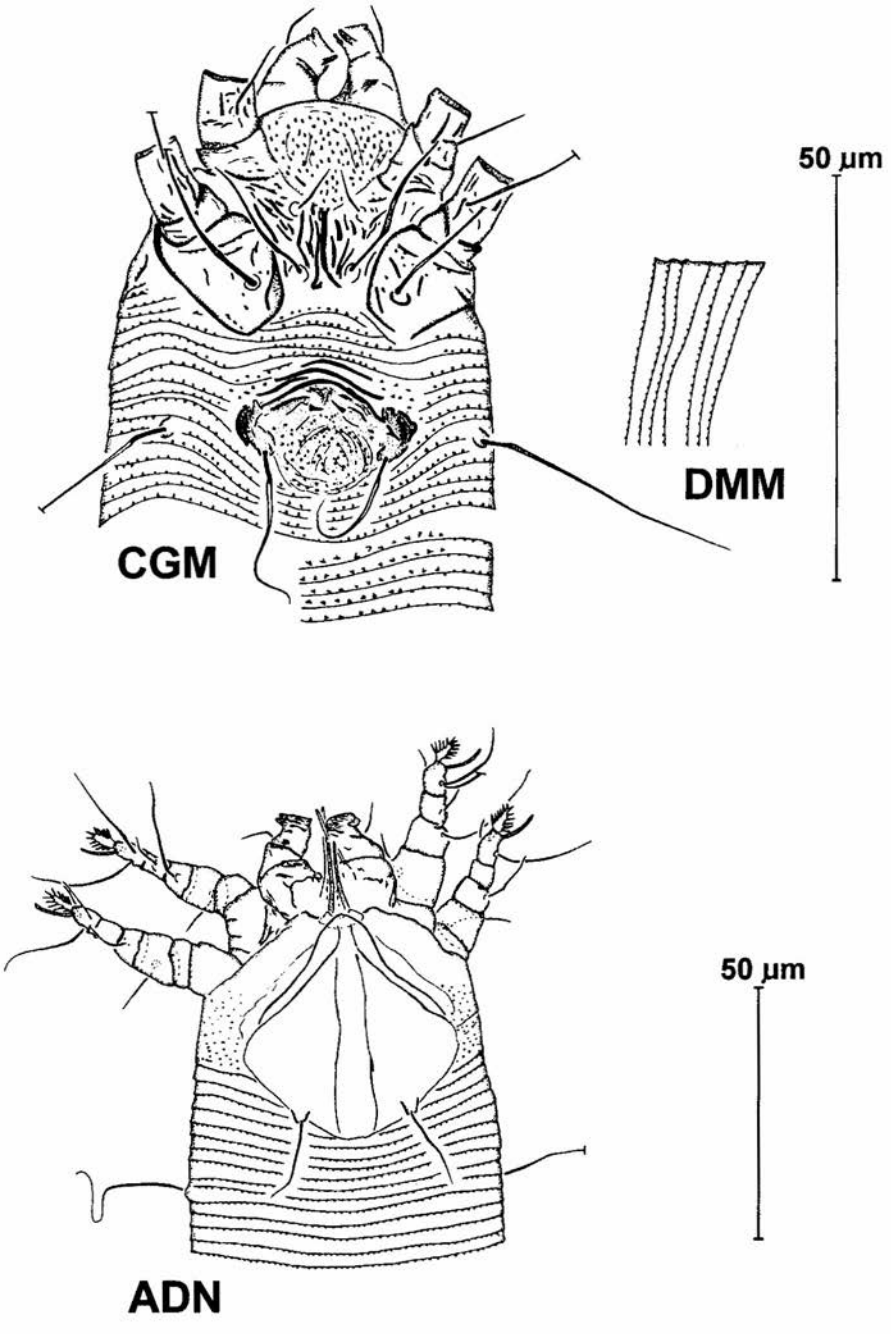
Prodorsal shield: 40 long, 41 wide. Triangular with pointed lobe over cheliceral base, but not less pointed than that of female. Sculpture similar to that of female,




71. *Aculodes calamaabditus* SKORACKA, female: D – dorsal aspect, DM – dorsal microtubercles, IG – internal genitalia, L1, L2 – legs I and II




72. *Aculodes calamaabditus* Skoracka, female: CG – coxigenital region, PV – ventral telosome




73. *Aculodes calamaabditus* SKORACKA: ADN – antero-dorsal aspect of nymph, CGM – coxigenital region of male, DMM – dorsal microtubercles of male

with one exception: median line present on rear 1/3. Setae *sc* 14 long, 23-24 apart, projecting to rear.

Coxae: with a pattern similar to that of female (Fig. 73).

Opisthosoma with 56-68 dorsal annuli, 62-68 ventral annuli, 5 coxigenital annuli. Annuli with minute microtubercles; dorsal numerous, bead-like, set along annuli margins (Fig. 73); ventral conical and acute, not ahead or slightly ahead of annuli margins.

Leg I: 29-30; femur 8-10, seta *bv* 10-12; genu 4-5, seta *l"* 20-21; tibia 5-6, seta *l'* 8-9; tarsus 6-7; solenidion *ω* 7-10; empodium 8-10, simple, 6-7-rayed, symmetrical.

Leg II: 27-29; femur 9-10, *bv* 12-17; genu 4-5, *l"* 11-14; tibia 4-5; tarsus 6-7; solenidion *ω* 8; empodium 9-10, 6-rayed, symmetrical.

Genital parts 15-16 long, 19-20 wide, surface below eugenital setae with lines and minute, bead-like microtubercles (Fig. 73).

Length of setae: pedipalpal: *d* 7-8; *v* 3; coxal *1b* 8; opisthosomal: *c2* 27-38; *d* 29; *e* 40; *f* 22-29; *h1* 4; *3a* 16-25.

Nymph (n=2) (Fig. 73): Body slightly spindleform. Body length 202-237; width 61. Gnathosoma 24-27 long; chelicerae 22-25 long.

Prodorsal shield: 39-45 long, 40 wide. Triangularly-oval with small, subrounded lobe reaching half of cheliceral base. Sculpture: median line absent; admedian and submedian lines similar to that of female. Setae *sc* 12-17 long, 21 apart, projecting to rear.

Opisthosoma with 45-50 dorsal annuli, 46-47 ventral annuli, 10 coxigenital annuli. Annuli with minute, rounded microtubercles set along annuli margins: dorsal bead-like; ventral conical, less than dorsal.

Leg I: 36; femur 9; genu 4-5, seta *l"* 20; tibia 5, seta *l'* 6-8; tarsus 5-7; solenidion *ω* 6-7; empodium 7-9, simple, 5-6-rayed, symmetrical.

Leg II: 25-35; femur 7, *bv* 11-12; genu 4, *l"* 10-11; tibia 4-5; tarsus 5-6; solenidion *ω* 7-8; empodium 8-9, 5-6-rayed, symmetrical.

Length of setae: pedipalpal: *d* 7; *v* 2-3; opisthosomal: *c2* 18-27; *d* 18; *e* 17; *f* 19; *h1* 3-4; *3a* 11-20.

Larva (n=1): Body vermiform. Body length 133; width 44. Chelicerae 18 long.

Leg I: femur 5; genu 3; solenidion *ω* 7; empodium 6, simple, 5-rayed, symmetrical.

Leg II: solenidion *ω* 6; empodium 6, 5-rayed, symmetrical.

Length of setae: opisthosomal: *c2* 15; *f* 14.

HOST PLANT

*Calamagrostis epigeios* (L.) ROTH. Relation to host plant: vagrant on the upper leaf surfaces, often hiding in rows; no visible damages.

MATERIAL

18 females, 6 males, 4 nymphs, 2 larvae from Modła near Głogów, pinewood margin [MOG3], 26.07.1998, leg. AS.

Other records: *C. epigeios:* [GLD1] - 23.04.200, (23); 04.04.1999, (55).

ECOLOGICAL NOTES

Species found only on *C. epigeios*, which seems to be an accidental host for this mite species. Its density was ($n$=397; $k$=2) $D$=0.9 (*Cl*: 0.0-3.1) specimens per shoot. However, high value of intensity ($I$=31.5; *Cl*: 0.0-107.0 specimens per shoot), and low value of prevelence ($P$=2.9%; *Cl:* 0.4%-9.9%) suggest that *C. epigeios* may be a suitable host for *A. calamaabditus*, and mite infestation was limited by other environmental factors.

GENERAL DISTRIBUTION

Palearctic Region. The species so far was recorded in Poland (SKORACKA 2003).

## *Aculodes capillarisi* SKORACKA, 2003

DESCRIPTION

Complete description in SKORACKA (2003)

Female (n=9) (Figs 74-76): Body slightly spindleform. Body length 176-257; width 48-55. Gnathosoma 19-24 long; chelicerae 19-22 long.

Prodorsal shield: 41-46 long, 38-41 wide. Triangularly-oval, with distinct, pointed lobe over cheliceral base. Sculpture: median line absent; admedian lines complete; submedian lines on rear half of shield. Setae *sc* 32-45 long, 22-26 apart.

Coxae: with a pattern of numerous lines and conical microtubercles. Sternal line distinct.

Opisthosoma with 54-61 dorsal annuli, 61-78 ventral annuli, 5-6 coxigenital annuli. Annuli with conical microtubercles set along annuli margins: dorsal minute, not pointed, on telosomal annuli more numerous; ventral pointed.

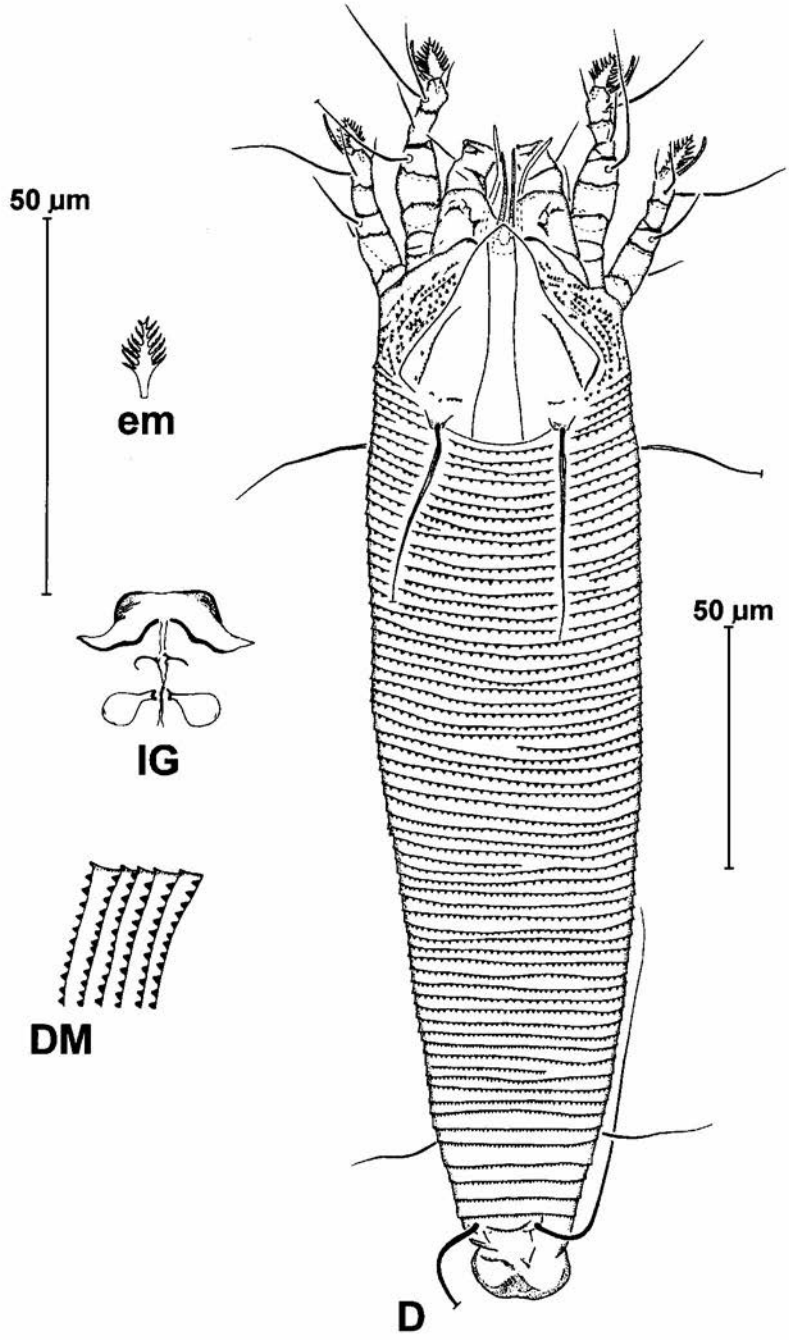
Leg I: 36-45; femur 10-11, seta *bv* 10-14; genu 5-6, seta *l''* 23-32; tibia 7-8, seta *l'* 9-12; tarsus 7-8; solenidion $\omega$ 8-10; empodium 10-11, simple, 7-8-rayed, symmetrical.

Leg II: 30-36; femur 10-11, *bv* 11-16; genu 4-6, *l''* 11-16; tibia 6; tarsus 7-8; solenidion $\omega$ 9-10; empodium 10-11, 7-8-rayed, symmetrical.

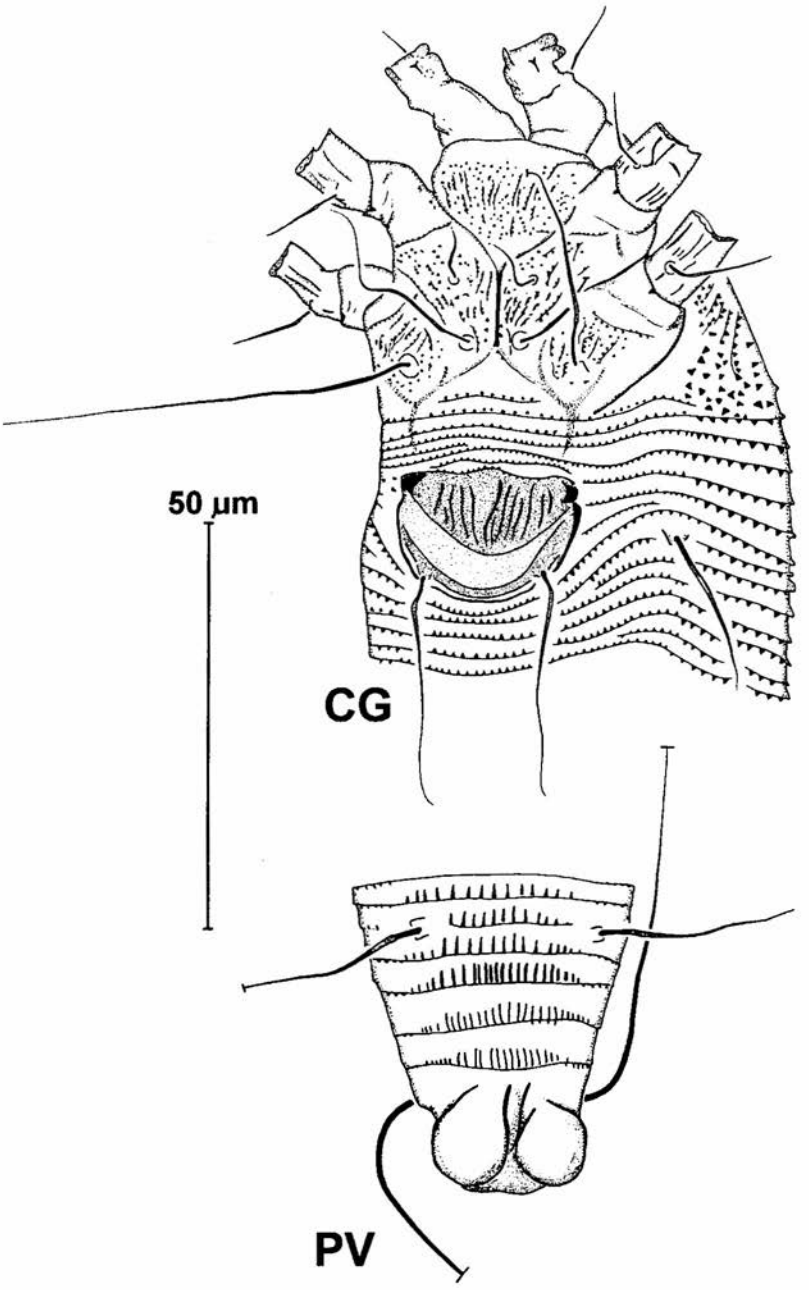
Genital parts 11-14 long, 20-24 wide, genital coverflap with 11-13 longitudinal ribs.

Length of setae: pedipalpal: *d* 8-11; *v* 2; *ep* 3-4; coxal: *1b* 19-24; *2a* 45-46; opisthosomal: *c2* 21-29; *d* 29-48; *e* 19-36; *f* 22-27; *h1* 4-5; *h2* 81-95; *3a* 17-33.

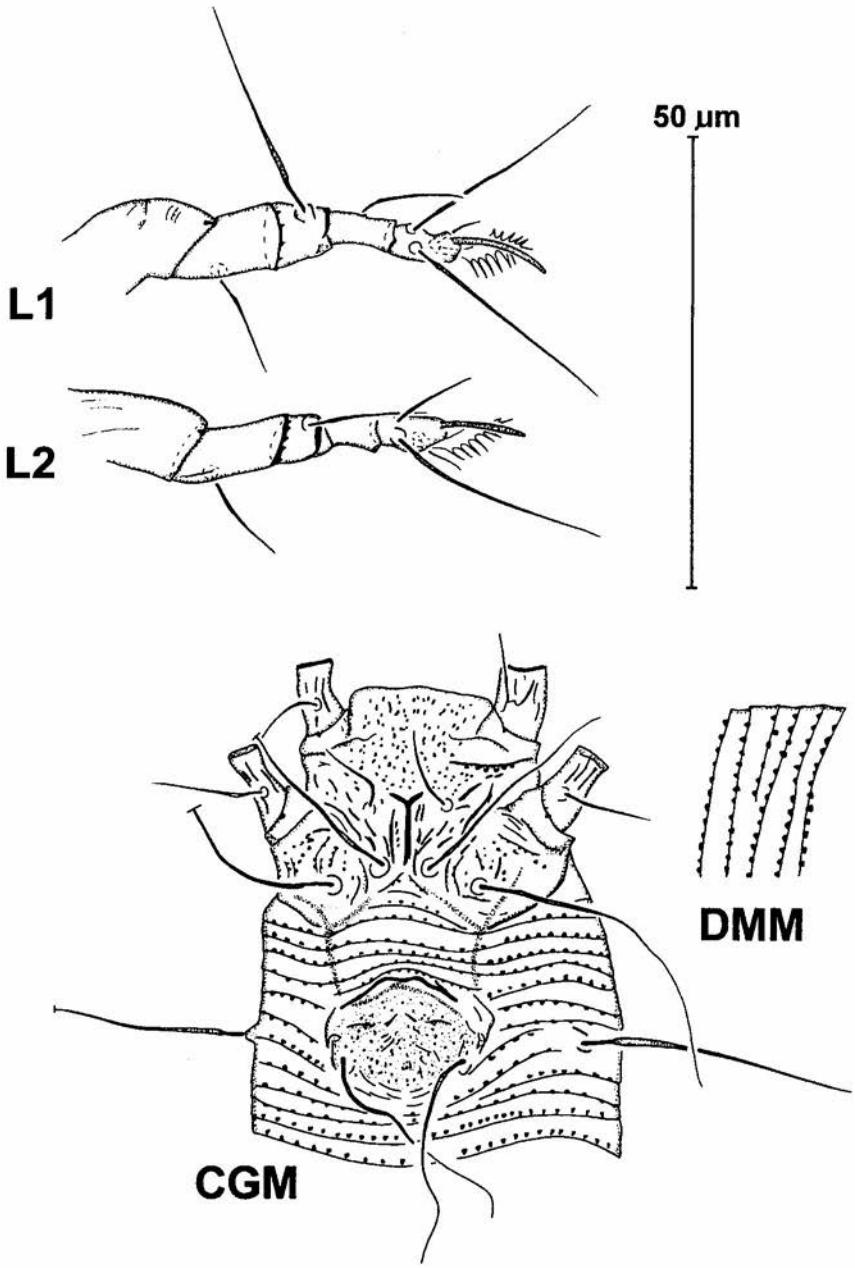
Distance between tubercles bearing coxal setae: *1b* 10; *1a* 6-8; *2a* 18-24; *1b* and *1a* 8-10; *1a* and *2a* 7-10.



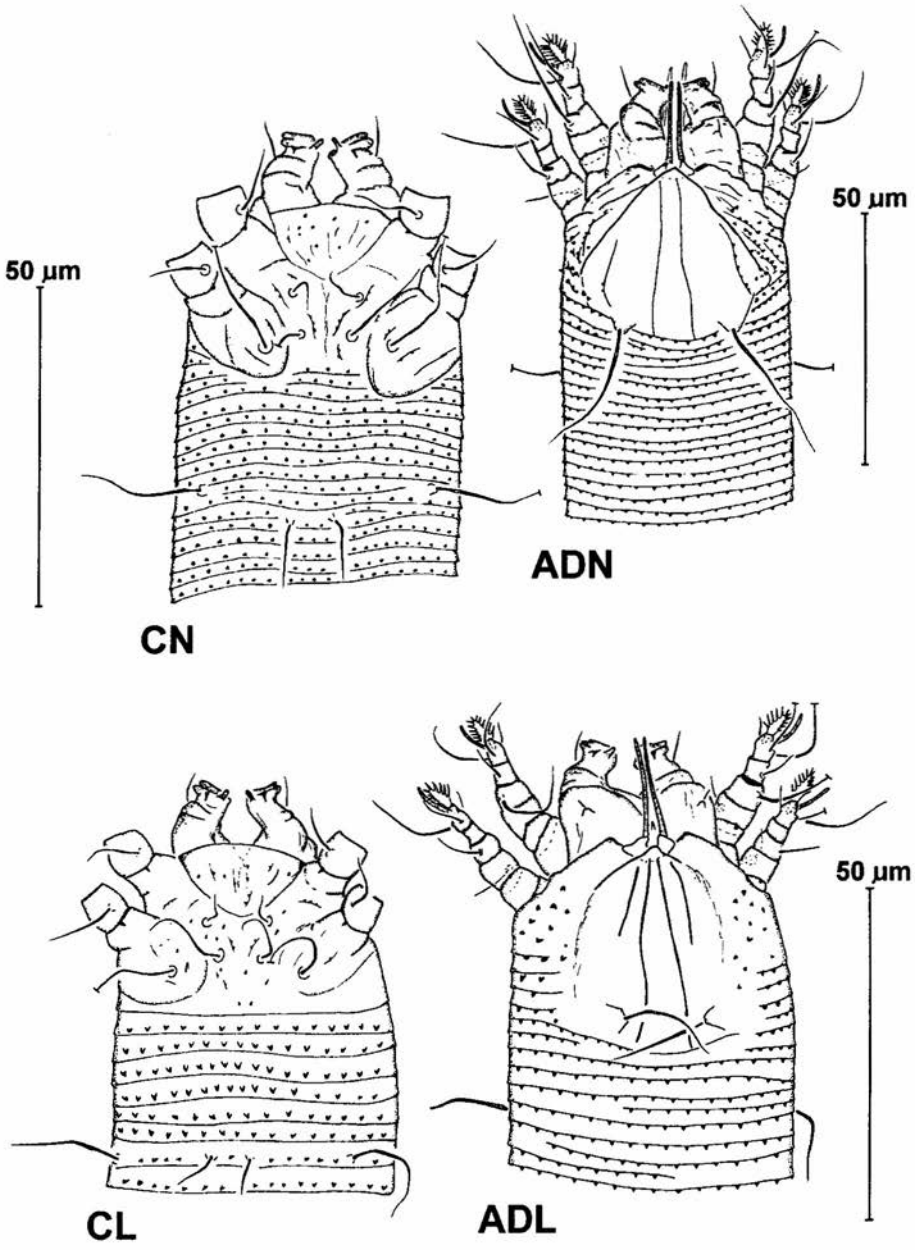

74. *Aculodes capillarisi* SKORACKA, female: D – dorsal aspect, DM – dorsal microtubercles, IG – internal genitalia, em - empodium




75. *Aculodes capillarisi* SKORACKA, female: CG – coxigenital region, PV – ventral telosome




76. *Aculodes capillarisi* Skoracka: CGM – coxigenital region of male, DMM – dorsal microtubercles of male, L1, L2 – legs I and II of female




77. *Aculodes capillarisi* SKORACKA: ADL – antero-dorsal aspect of larva, ADN – antero-dorsal aspect of nymph, CL - coxisternum and *3a* and *c2* setae of larva, CN - coxisternum and *3a* and *c2* setae of nymph

Male (n=5): Body slightly spindleform. Body length 166-218; width 40-48. Gnathosoma 17-23 long; chelicerae 18-20 long.

Prodorsal shield: 38-41 long, 33-34 wide. Shape and sculpture similar to that of female. Setae *sc* 31-35 long, 21-24 apart, projecting to rear.

Coxae: with a pattern similar to that of female (Fig. 76).

Opisthosoma with 47-52 dorsal annuli, 49-60 ventral annuli, 5-6 coxigenital annuli. Annuli with minute, semirounded or conical microtubercles: dorsal not pointed, set along annuli margins (Fig. 76), on telosomal annuli more narrow; ventral acute, slightly ahead of annuli margins.

Leg I: 27-36; femur 8-10, seta *bv* 8-13; genu 5, seta *l''* 19-21; tibia 6-8, seta *l'* 6-9; tarsus 6-8; solenidion *ω* 8-9; empodium 9-10, simple, 7-rayed, symmetrical.

Leg II: 25-35; femur 8-9, *bv* 11-14; genu 4-5, *l''* 10-13; tibia 5; tarsus 6-8; solenidion *ω* 8-10; empodium 8-10, 6-7-rayed, symmetrical.

Genital parts 12-15 long, 16-19 wide, surface below eugenital setae with minute microtubercles (Fig. 76).

Length of setae: pedipalpal: *d* 8-9; *v* 2; *ep* 3; coxal *1b* 8-9; *1a* 15-17; *2a* 30-38; opisthosomal: *c2* 28-34; *d* 31-43; *e* 19-22; *f* 18-27; *h1* 4-6; *3a* 17-24.

Nymph (n=9) (Fig. 77): Body slightly spindleform. Body length 154-208; width 42-48. Gnathosoma 18-20 long; chelicerae 15-21 long.

Prodorsal shield: 35-40 long, 33-40 wide. Triangular with small, rounded lobe reaching half of cheliceral base. Sculpture similar to that of female. Setae *sc* 23-30 long, 20-24 apart, projecting to rear.

Opisthosoma with 46-55 dorsal annuli, 48-55 ventral annuli, 8-10 coxigenital annuli. Annuli with conical, not pointed microtubercles: dorsal sparse, well separated, set along annuli margins; ventral slightly ahead of annuli margins.

Leg I: 25-32; femur 6-7, seta *bv* 7-9; genu 4, seta *l''* 17-23; tibia 4-5, seta *l'* 6-8; tarsus 5-6; solenidion *ω* 6-8; empodium 7-8, simple, 6-7-rayed, symmetrical.

Leg II: 24-27; femur 6-9, *bv* 8-11; genu 3-4, *l''* 10-12; tibia 3-4; tarsus 5-6; solenidion *ω* 7-8; empodium 7-9, 6-7-rayed, symmetrical.

Length of setae: pedipalpal: *d* 6-10; *v* 2; *ep* 2; coxal: *1b* 6-9; *1a* 13-15; *2a* 34; opisthosomal: *c2* 18-24; *d* 22-37; *e* 10-22; *f* 14-27; *h1* 3-6; *3a* 8-16.

Larva (n=3) (Fig. 77): Body vermiform. Body length 154; width 42-49. Gnathosoma 19 long; chelicerae 17-18 long.

Prodorsal shield: 28-30 long, 28-30 wide. Triangularly-oval without lobe over cheliceral base. Sculpture: median and admedian lines similar to that of female; submedian on rear 1/3 of shield, subparallel to admedian. Setae *sc* 13-16 long, 14-17 apart, projecting to rear.

Opisthosoma with 39-40 dorsal annuli, 29-32 ventral annuli, 5-7 coxigenital annuli. Annuli with microtubercles similar to that of nymph.

Leg I: 20-27; femur 5, *bv* 6-7; genu 3-4, seta *l''* 16-18; tibia 3-4, seta *l'* 5-9; tarsus 4; solenidion *ω* 5-7; empodium 6-7, simple, 5-6-rayed, symmetrical.

Leg II: 19-22; femur 5, seta *bv* 7-8; genu 3-4, *l''* 8-10; tibia 3-4; tarsus 4-5; solenidion $\omega$ 6; empodium 6, 5-rayed, symmetrical.

Length of setae: pedipalpal: *d* 4; *v* 2; coxal: *1a* 13-20; *2a* 28; opisthosomal: *c2* 15-19; *d* 12-15; *e* 7-10; *f* 16-17; *h1* 3; *3a* 5-6.

HOST PLANT

*Agrostis capillaris* L. Relation to host plant: vagrant on the upper leaf surface, mostly near the top; no visible damages.

MATERIAL

16 females, 9 males, 32 nymphs, 6 larvae from Biedrusko near Poznań, forest path at south form the Chojnicka street [PBP6], 12.08.1998, leg. AS.

ECOLOGICAL NOTES

Species found only on *A. capillaris*, which seems to be an accidental host for this mite species. The values of infestation: ($n$=70; $k$=2): $P$=2.0% (*Cl:* 0.9%-3.9%); $I$=13.9 (*Cl*: 4.9-33.4) specimens per shoot; $D$=0.3 (*Cl*: 0.1-0.7) specimens per shoot.

GENERAL DISTRIBUTION

Palearctic Region. The species so far was recorded in Poland (SKORACKA 2003).

## *Aculodes deschampsiae* (SUKHAREVA, 1972)

*Phytocoptes deschampsiae* SUKHAREVA, 1972

DESCRIPTION

Redescription in SKORACKA (2000).

Female (n=7) (Figs 78-79): Body slightly spindleform. Body length 236-276; width 52-58. Gnathosoma 28-31 long; chelicerae 25-30 long.

Prodorsal shield: 46-48 long, 40-49 wide. Elongate-triangular with pronounced lobe over gnathosoma. Sculpture: median line on rear half, divided into two lines, at least one of them splitting anteriorly; admedian lines complete; submedian lines on rear l' of shield, parallel to lateral margins; short, transverse lines forming obtuse angle over tubercles bearing *sc* setae. Setae *sc* 29-34 long, 29-32 apart, projecting to rear.

Coxae: with a pattern of short, slender lines. Sternal line distinct.

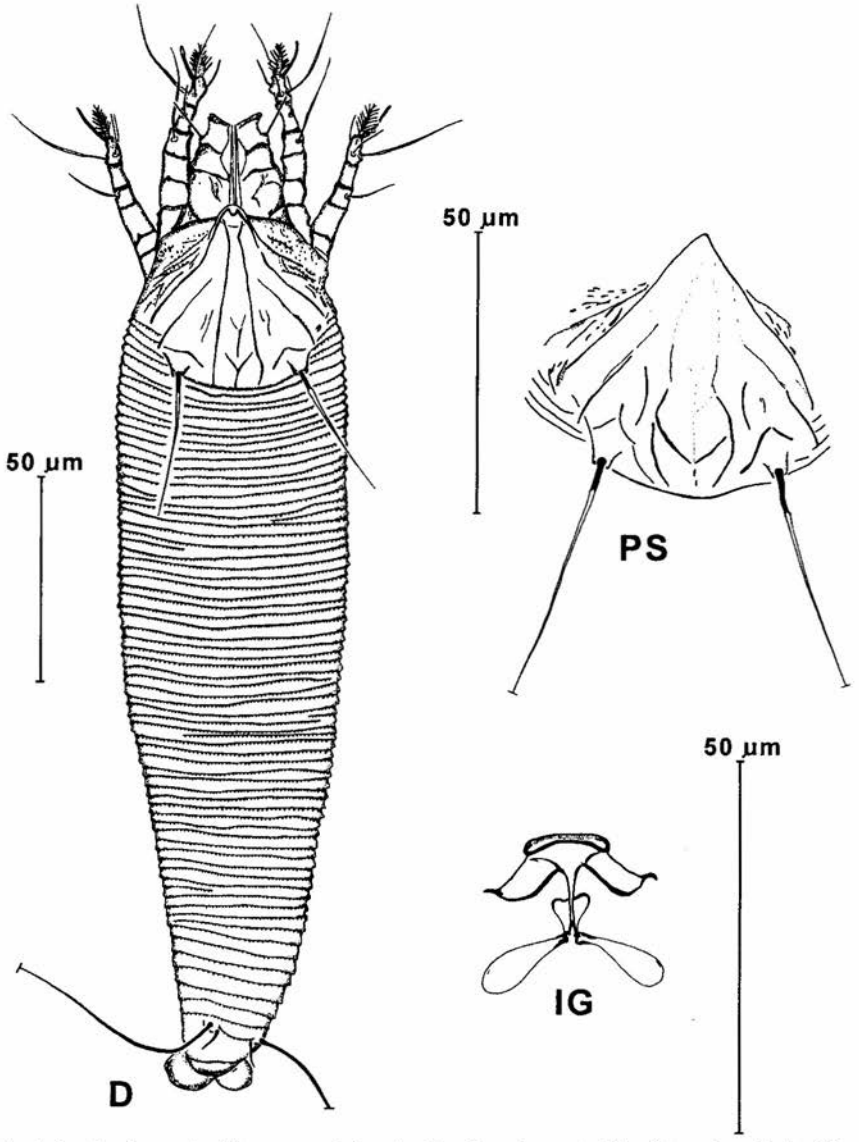
Opisthosoma with 59-64 dorsal annuli, 66-75 ventral annuli, 6 coxigenital annuli. Annuli with conical, pointed microtubercles set along annuli margins.

Leg I: 32-34; femur 9-10, seta *bv* 8-11; genu 5-6, seta *l''* 22-26; tibia 7-8, seta *l'* 9-10; tarsus 7-8; solenidion $\omega$ 10-11; empodium 10-11, simple, 7-8-rayed, symmetrical.

Leg II: 31-33; femur 9-11, *bv* 11-14; genu 5-6, *l''* 11-13; tibia 6-7; tarsus 7-8; solenidion $\omega$ 10-11; empodium 10-11, 7-8-rayed, symmetrical.

Genital parts 14-16 long, 22-24 wide, genital coverflap with 10-11 longitudinal ribs.

Length of setae: pedipalpal: *d* 8-10; *v* 2; *ep* 4; coxal: *1b* 8-10; *1a* 19-25; *2a* 42-46; opisthosomal: *c2* 35-43; *d* 32-45; *e* 18-29; *f* 20-27; *h1* 4-5; *h2* 76-83; *3a* 24-30.

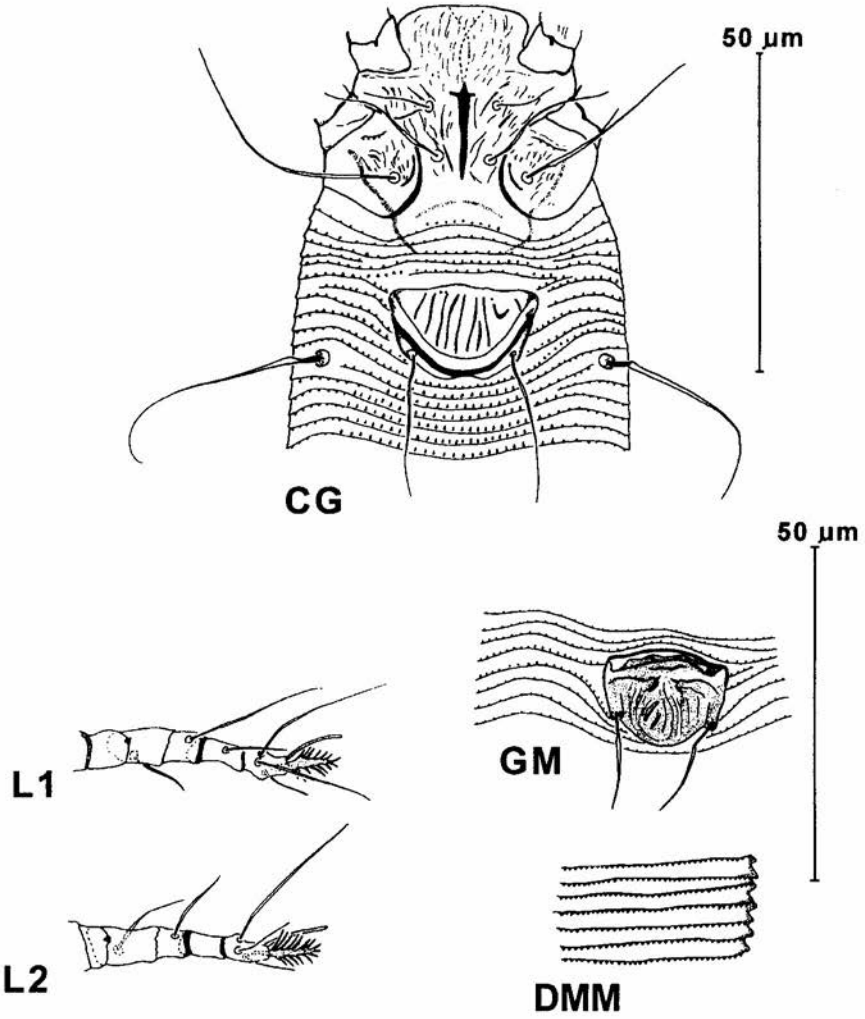



78. *Aculodes deschampsiae* (SUKHAREVA), female: D – dorsal aspect, IG – internal genitalia, PS – atypical prodorsal shield

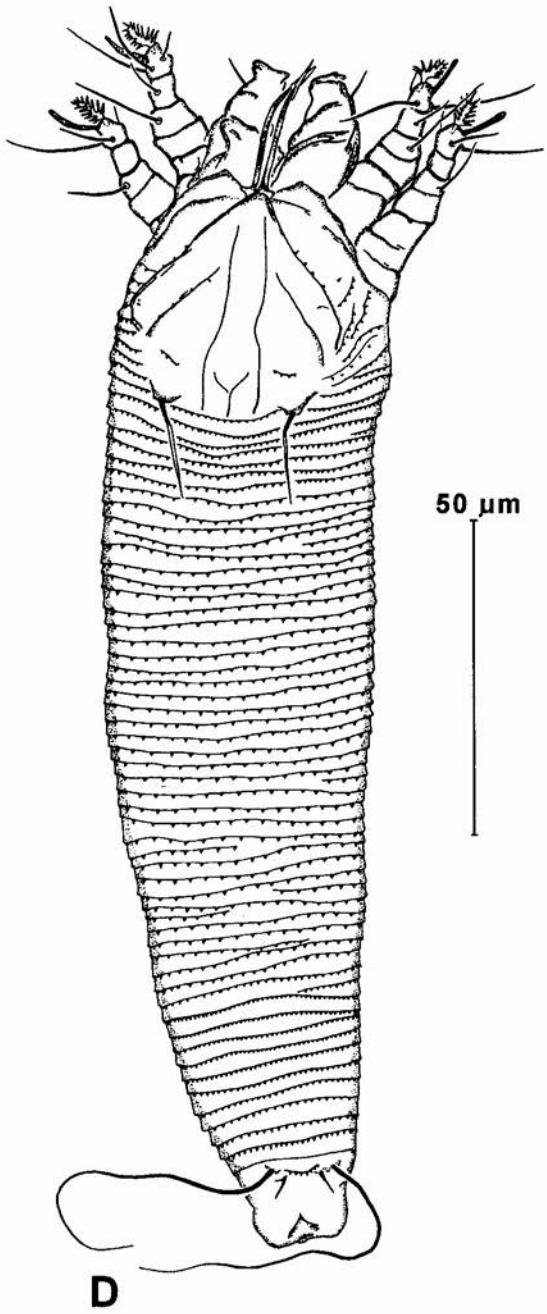
Distance between tubercles bearing coxal setae: *1b* 11-12; *1a* 8-10; *2a* 21-26; *1b* and *1a* 8 10; *1a* and *2a* 8-9.

Male (n=4): Body slightly spindleform. Body length 185-276; width 48-51. Gnathosoma 26-27 long; chelicerae 19-20 long.

Prodorsal shield 41-42 long, 41-43 wide. Shape and sculpture similar to that of female. Setae *sc* 24-27 long, 29-31 apart, projecting to rear.




79. *Aculodes deschampsiae* (SUKHAREVA): CG – coxigenital region of female, DMM – dorsal microtubercles of male, GM – genital region of male, L1, L2 – legs I and II of female




80. *Aculodes deschampsiae* (SUKHAREVA), nymph: D – dorsal aspect

Coxae: with a pattern similar to that of female.

Opisthosoma with 48-49 dorsal annuli, 58-59 ventral annuli. Annuli with pointed microtubercles (Fig. 79).

Leg I: 29; femur 9, seta *bv* 8; genu 5, seta *l''* 21-22; tibia 7, seta *l'* 10; tarsus 8; solenidion $\omega$ 10; empodium 10, simple, 7-rayed, symmetrical.

Leg II: 28-29; femur 10, *bv* 10-13; genu 5, *l''* 11-12; tibia 6; tarsus 7-8; solenidion $\omega$ 10; empodium 10, 7-rayed, symmetrical.

Genital parts 14 long, 19 wide, surface below eugenital setae with longitudinal lines (Fig. 79).

Length of setae: pedipalpal: *d* 7-8; coxal *1b* 8; *1a* 14-19; *2a* 26-29; opisthosomal: *c2* 37-38; *d* 29-32; *e* 24-30; *f* 23-25; *h1* 5; *h2* 90-95; *3a* 18-22.

Nymph (n=4) (Fig. 80): Body slightly spindleform. Body length 186-205; width 48-50. Gnathosoma 26-27 long; chelicerae 18-22 long.

Prodorsal shield: 38-39 long, 40 wide. Triangularly-oval, with small and rounded lobe over cheliceral base. Sculpture similar to that of female. Setae *sc* 19 long, 24-26 apart, projecting to rear.

Opisthosoma with 57-58 dorsal annuli, 58-59 ventral annuli. Annuli with conical and pointed microtubercles.

Leg I: 22-26; femur 8, seta *bv* 7; genu 4, seta *l''* 18-20; tibia 5, seta *l'* 6-7; tarsus 5-7; solenidion $\omega$ 8-9; empodium 9, simple, 7-rayed, symmetrical.

Leg II: 24-25; femur 6, *bv* 8; genu 3, *l''* 8-9; tibia 4-5; tarsus 5-6; solenidion $\omega$ 8-9; empodium 9, 7-rayed, symmetrical.

Length of setae: pedipalpal: *d* 6; coxal: *2a* 29; opisthosomal: *c2* 24; *d* 16-19; *e* 11; *f* 17; *h1* 3; *3a* 5-8.

Larva not found.

HOST PLANT

*Deschampsia caespitosa* (L.) P. BEAUV. Relation to host plant: vagrant in the furrows of the upper leaf surface; no visible damages.

MATERIAL

78 females, 14 males, 9 nymphs from Katowice, Tysiąclecia district, urban park [KAT2], 9.05.1999; leg. A.S.

Other records: *D. caespitosa*: [PWH] - 24.08.1999, (182); [BIA1] - 01.05.2000, (96); [WIL1] - 01.04.2001, (282); 20.04.2001, (39).

REMARKS

Some females and males collected in Wilkowo near Poznań [WIL1] differ from other specimens by shape and sculpture of prodorsal shield (Fig. 78). Shield is triangular with a little and pointed lobe over cheliceral base. Its sculpture: median line on rear half, its anterior part consists of slender dashes, its rear part consists of two distinct arched lines; admedian lines in anterior part arched and

slender, in rear part arched and distinct; I and II submedian lines short and arched, on rear half; short, arched lines present over tubercles bearing *sc* setae. Specimens with atypical prodorsal shield differ from specimens with typical prodorsal shield also by the length of *sc* setae: 44-57 ($n$=10) in females; 29 ($n$=4) in males. This polymorphism may be a result of the presence of deuterogynous or dispersal forms. However, it is difficult to conclude what is the source of this polymorphism without more precise experimental work.

ECOLOGICAL NOTES

Specialist I on *D. caespitosa*. The values of mites infestation: ($n$=49; $k$=35): $P$=71.4% (*Cl*: 56.7%-83.4%); $I$=27.2 (*Cl*: 17.3-42.7) specimens per shoot; $D$=19.4 (*Cl*: 12.4 30.5) specimens per shoot.

GENERAL DISTRIBUTION

Palearctic Region. The species so far was recorded in Russia and Poland (SUKHAREVA 1972; SKORACKA 2000).

## *Aculodes dubius* (NALEPA, 1891)

*Phytocoptes dubius* NALEPA, 1891
*Phyllocoptes dubius* (NALEPA, 1891)
*Vasates dubius* (NALEPA, 1891)
*Aculops dubius* (NALEPA, 1891)

DESCRIPTION

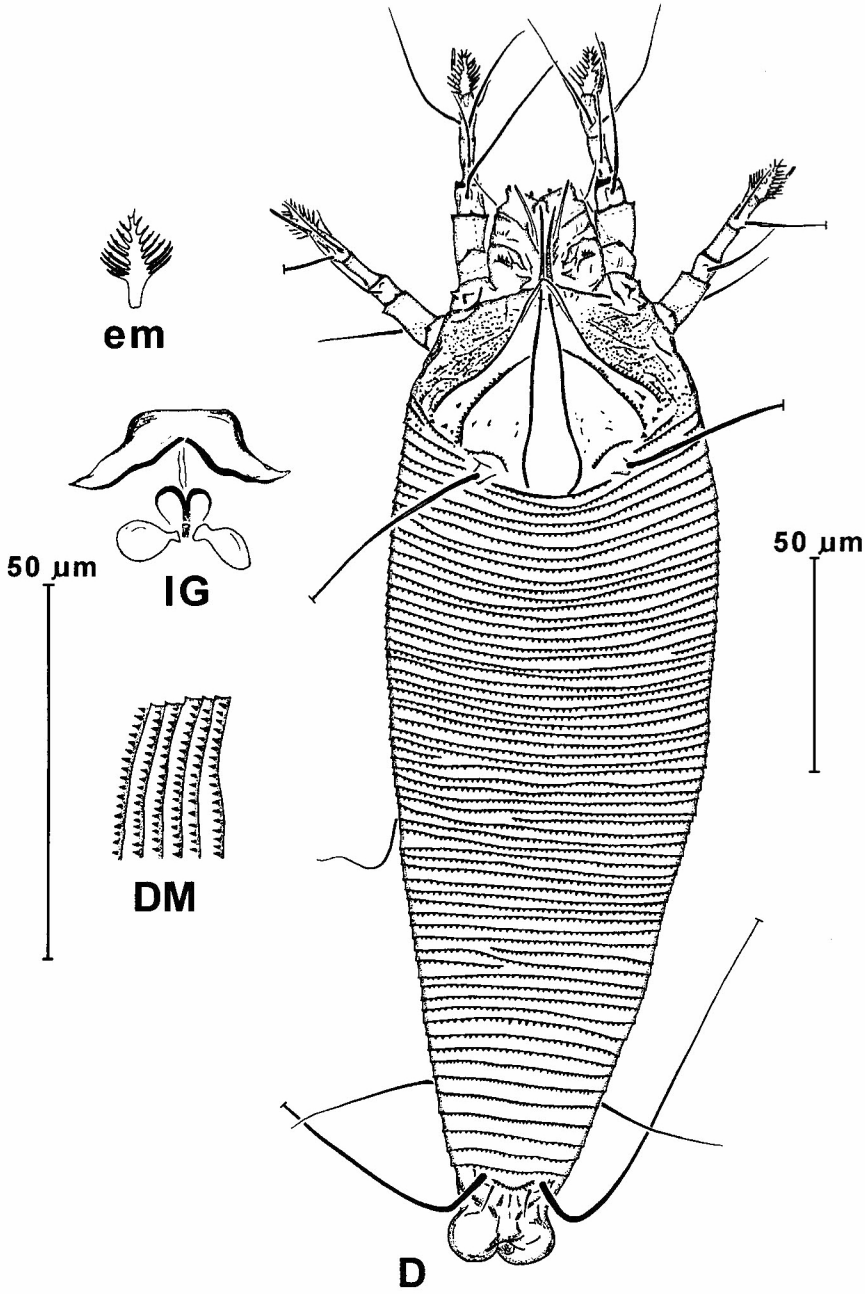
Female (n=14) (Figs 81-83): Body spindleform. Body length 222-325; width 68-78. Gnathosoma 27-34, chelicerae 22-26 long.

Prodorsal shield: 46-53 long, 48-55 wide. Triangular with large, pointed lobe over cheliceral base. Sculpture: median line absent; admedian lines complete, diverging from base of anterior lobe to rear margin, near rear margin running to center of shield; I submedian lines arched, with minute and conical microtubercles, on rear 2/3 of shield, connecting with admedian lines in its 1/3 of length, with posterior fragment outside tubercles bearing *sc* setae; transverse, arched lines with minute and conical microtubercles over tubercles bearing *sc* setae. Tubercles of setae *sc* on rear margin of shield, setae *sc* 64-90 long, 31-35 apart, projecting to rear. Minute and conical microtubercles present on surface near shield.

Coxae: with a pattern of subrounded microtubercles and numerous lines with minute microtuberlces. Sternal line slender.

Opisthosoma with 56-64 dorsal annuli, 74-83 ventral annuli, 5-6 coxigenital annuli. Annuli with conical microtubercles set along annuli margins: dorsal on telosomal annuli minute; ventral pointed, on telosomal annuli elongated.

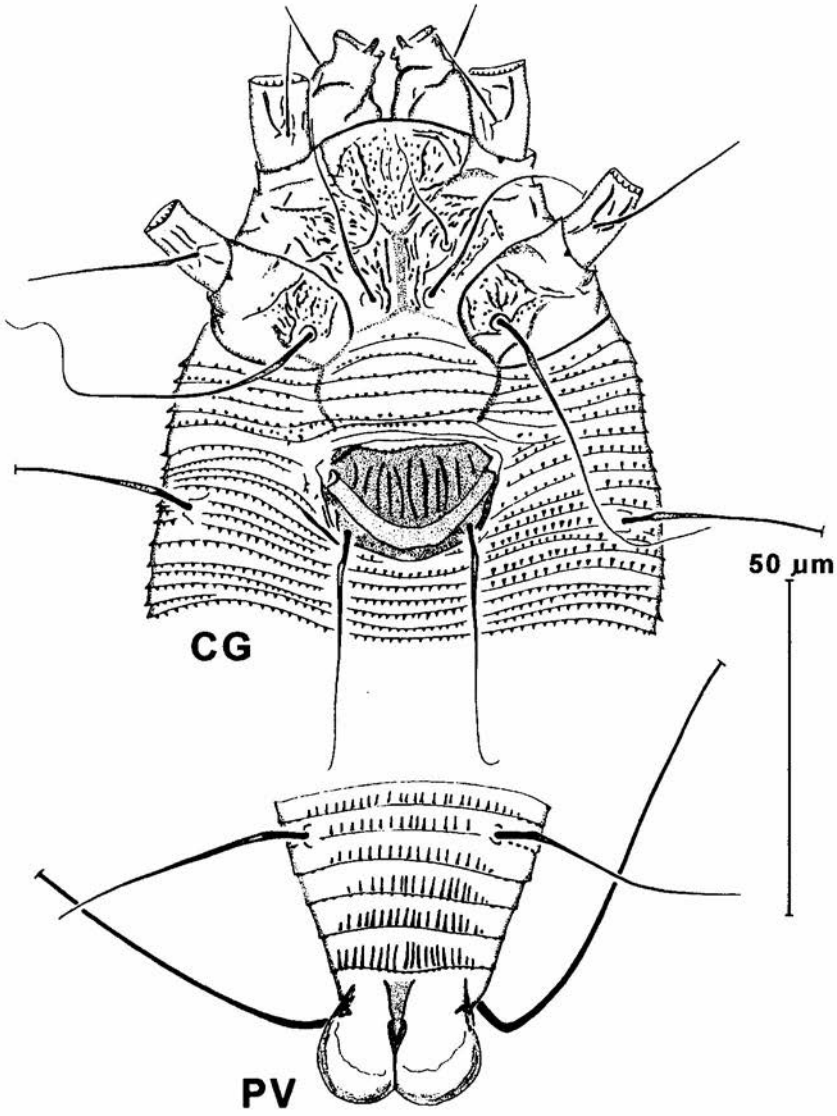
Leg I: 43-52; femur 11-13, seta *bv* 13-20; genu 7-8, seta *l"* 33-41; tibia 9-11, seta *l'* 10-17; tarsus 9-10, setae: *ft"* 29-36; *ft'* 26-31, *u'* 7-10; solenidion $\omega$ 10-12;



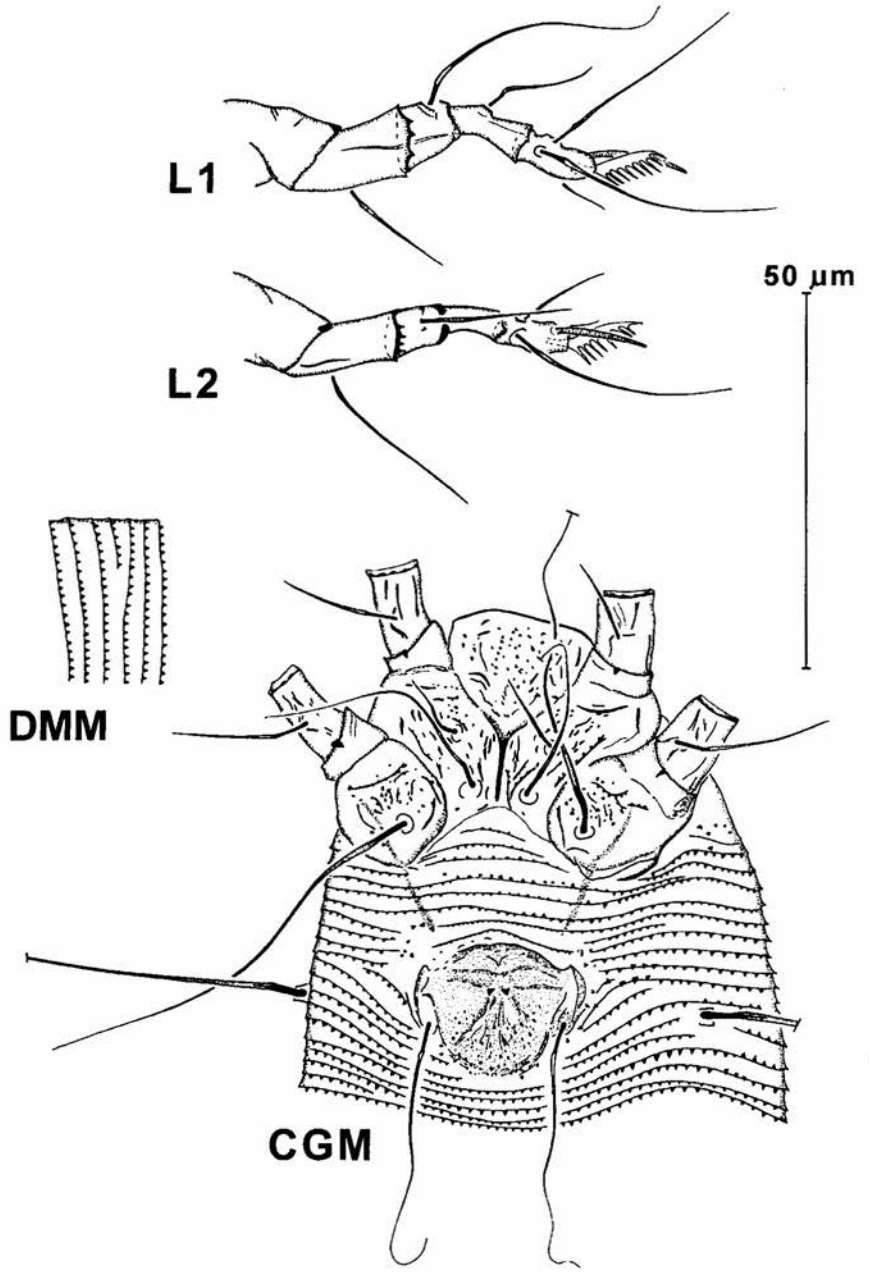

81. *Aculodes dubius* (NALEPA), female: D – dorsal aspect, DM – dorsal microtubercles, IG – internal genitalia, em - empodium

empodium 11-14, simple, 9-rayed, symmetrical. Position of setae: *bv* 5-6; *l''* 3-5; *l'* 3-6; *ft''* and *ft'* 3; *u'* 5-7.

Leg II: 41-48; femur 12-14, *bv* 24-29; genu 5-7, *l''* 18-22; tibia 7-9; tarsus 9-10, *ft''* 29-32, *ft'* 10-16, *u'* 5-9; solenidion $\omega$ 10-13; empodium 12-13, 9-rayed, symmetrical. Position of setae: *bv* 5-6; *l''* 3-5; *ft''* and *ft'* 3; *u'* 5-7.




82. *Aculodes dubius* (NALEPA), female: CG – coxigenital region, PV – ventral telosome

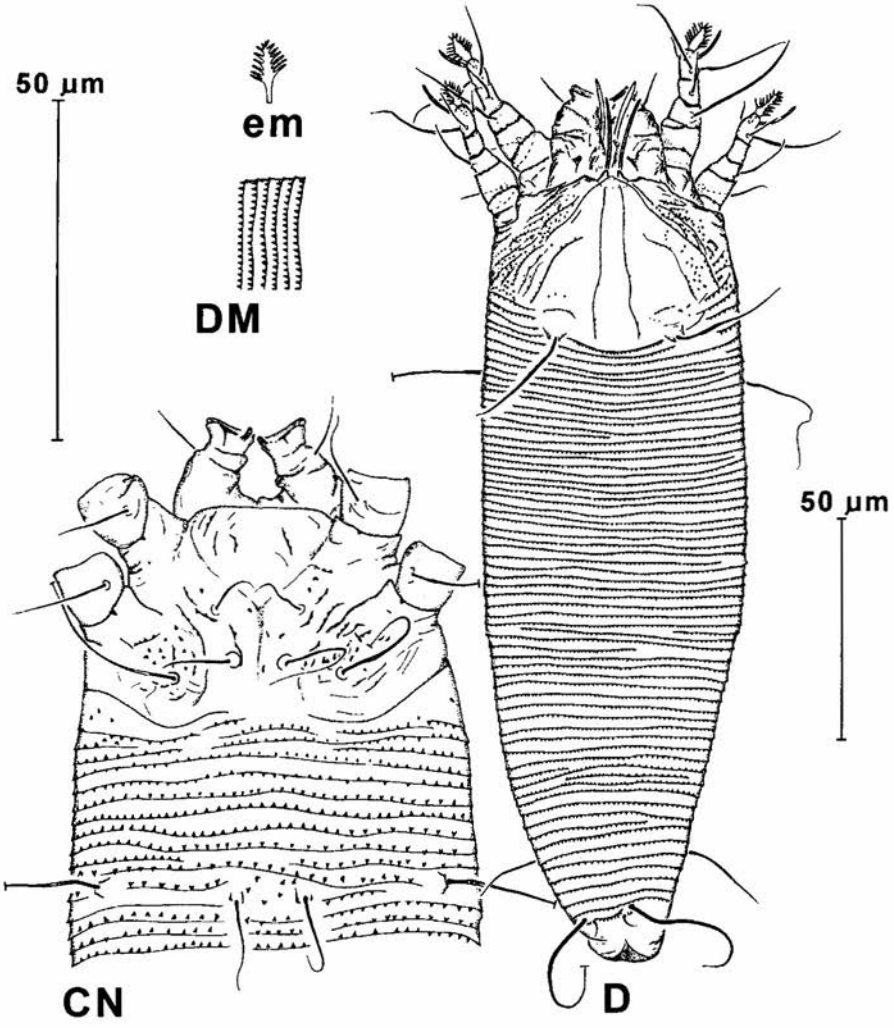



83. *Aculodes dubius* (NALEPA): CGM – coxigenital region of male, DMM – dorsal microtubercles of male, L1, L2 – legs I and II of female

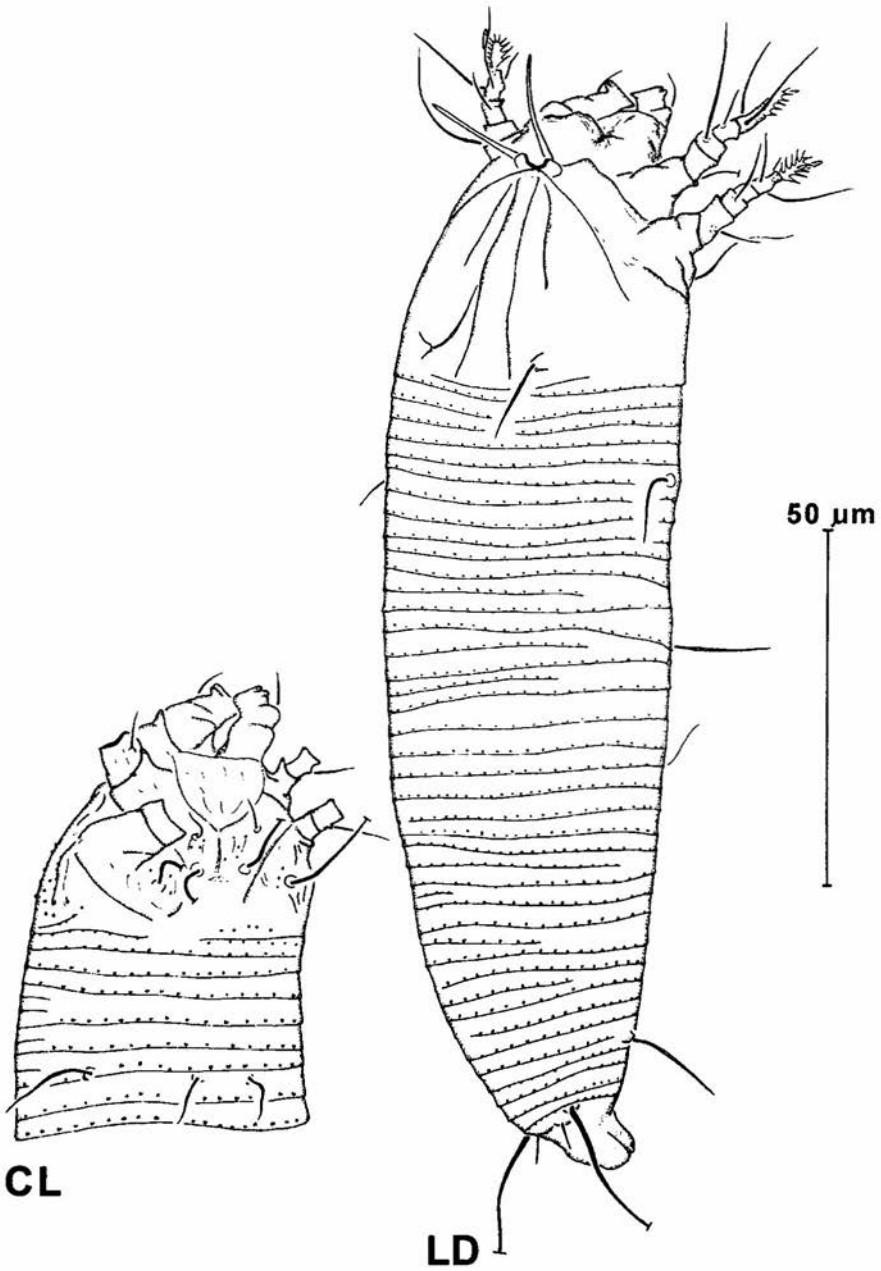
Genital parts 18-21 long, 25-28 wide, genital coverflap with 9-13 longitudinal ribs.

Length of setae: pedipalpal: *d* 11-14; *v* 2-3; *ep* 3-4; coxal: *1b* 10-12; *1a* 29-43; *2a* 51-60; opisthosomal: *c2* 53-70; *d* 50-65; *e* 38-51; *f* 29-40; *h1* 6-8; *h2* 90-128; *3a* 31-45.

Distance between tubercles bearing setae: coxal: *1b* 13-15; *1a* 8-10; *2a* 26-30; *1b* and *1a* 8-10; *1a* and *2a* 10-11; opisthosomal: *c2* 60-71; *d* 39-54; *e* 18-28; *f* 26-32; *3a* 17-20; telosomal: *h1* 8-10; *h2* 13-15; *h1* and *h2* 2-4.




84. *Aculodes dubius* (NALEPA), nymph: CN - coxisternum and *3a* and *c2* setae, D – dorsal aspect, DM – dorsal microtubercles, em – empodium




85. *Aculodes dubius* (NALEPA), larva: CL - coxisternum and *3a* and *c2* setae, LD – latero-dorsal aspect

Number of ventral annuli bearing setae: *c2* 8-12; *d* 24-31; *e* 47-54; *f* 70-79, 5 from rear.

Male (n=6): Body spindleform. Body length 208-257; width 62-68. Gnathosoma 24-31 long; chelicerae 20-22 long.

Prodorsal shield: 44-46 long, 48-50 wide. Shape and sculpture similar to that of female, with one exception: anterior lobe is less pointed than that of female. Tubercles of setae *sc* on rear margin of shield, setae *sc* 49-55 long, 29-31 apart, projecting to rear.

Coxae: with a pattern similar to that of female (Fig. 83).

Opisthosoma with 49-54 dorsal annuli, 58-71 ventral annuli, 5-8 coxigenital annuli. Annuli with conical microtubercles set along annuli margins: dorsal minute (Fig. 83); ventral pointed.

Leg I: 37-43; femur 10-11, seta *bv* 12-15; genu 6, seta *l''* 30-35; tibia 8-10, seta *l'* 10-14; tarsus 8-9, setae: *ft''* 24-31; *ft'* 19-29, *u'* 6-8; solenidion *ω* 9-10; empodium 10-12, simple, 8-rayed, symmetrical. Position of setae: *bv* 4-5; *l''* 3-4; *l'* 4-5; *ft''* and *ft'* 3; *u'* 5-6.

Leg II: 36-41; femur 10-11, *bv* 19-23; genu 5-6, *l''* 16-19; tibia 7-8; tarsus 8-9, *ft''* 26-29, *ft'* 10-12, *u'* 5-7; solenidion *ω* 10-11; empodium 10-11, 8-rayed, symmetrical. Position of setae: *bv* 4-5; *l''* 3-4; *ft''* and *ft'* 2-3; *u'* 4-6.

Genital parts 18-21 long, 23-25 wide, surface below the eugenital setae with few lines and numerous minute and subrounded microtubercles (Fig. 83).

Length of setae: pedipalpal: *d* 11-13; *v* 2-3; *ep* 3-4; coxal: *1b* 9-13; *1a* 25-31; *2a* 49-61; opisthosomal: *c2* 48-57; *d* 54-31; *e* 30-45; *f* 32-40; *h1* 5-6; *h2* 85-100; *3a* 27-33.

Distance between tubercles bearing setae: coxal: *1b* 12-14; *1a* 8-10; *2a* 23-28; *1b* and *1a* 7-9; *1a* and *2a* 9-11; opisthosomal: *c2* 55-59; *d* 36-43; *e* 17-21; *f* 25-27; *3a* 17-19; *h1* 8-10; *h2* 11-12; *h1* and *h2* 2-3.

Number of ventral annuli bearing setae: *c2* 8-11; *d* 21-22; *e* 32-42; *f* 54-67, 5 from rear.

Nymph (n=8) (Fig. 84): Body spindleform. Body length 184-240; width 57-62. Gnathosoma 22-26 long; chelicerae 18-22 long.

Prodorsal shield: 38-43 long, 43-47 wide. Triangular with lobe reaching half of cheliceral base, less pointed than that of female. Sculpture: similar to that of female, with one exception: submedian lines not connecting to admedian. Tubercles of setae *sc* on rear margin of shield, setae *sc* 24-40 long, 27-30 apart, projecting to rear.

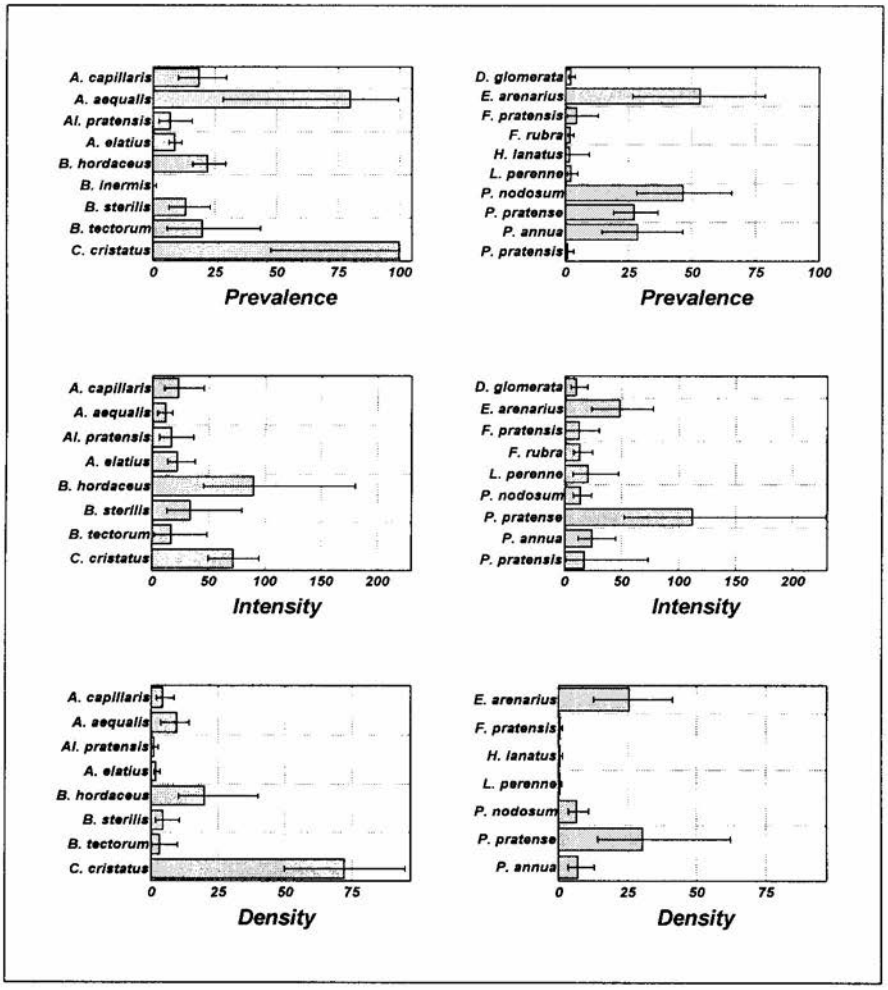
Coxae: with a pattern of few lines with subrounded microtubercles and few conical microtubercles; on coxae II lines longer than on coxae II. Sternal line slender.

Opisthosoma with 59-66 dorsal annuli, 56-63 ventral annuli, 8-11 coxigenital annuli. Annuli with microtubercles similar to that of female.

Leg I: 31-35; femur 8-9, seta *bv* 9-12; genu 5-6, seta *l"* 25-30; tibia 6-7, seta *l'* 7-10; tarsus 7, setae: *f"*20-24; *ft'* 17-20, *u'* 4-6; solenidion *ω* 7-8; empodium 9-11, simple, 7-8–rayed, symmetrical. Position of setae: *bv* 3-4; *l"* 3; *l'* 3-4; *ft"* and *ft'* 2-3; *u'* 4-5.

Leg II: 28-32; femur 8-9, *bv* 12-16; genu 4-5, *l"* 11-13; tibia 4-6; tarsus 6-8, *ft"* 19-23, *ft'* 6-10, *u'* 4-5; solenidion *ω* 8-9; empodium 8-10, 7-8-rayed, symmetrical. Position of setae: *bv* 3-5; *l"* 2-3; *ft"* and *ft'* 2; *u'* 4.

Length of setae: pedipalpal: *d* 8-10; *v* 2; *ep* 2-3; coxal: *1b* 6-9; *1a* 14-20; *2a* 33-37; opisthosomal: *c2* 30-38; *d* 29-44; *e* 16-27; *f* 19-28; *3a* 12-15; *h1* 4-5; *h2* 57-80.




86. Prevalence, intensity and density of infestation of *Aculodes dubius* on grass species. For generic names of grasses see the text.

Distance between tubercles bearing setae: coxal: *1b* 11-12; *1a* 7-10; *2a* 24-27; *1b* and *1a* 8-9; *1a* and *2a* 8-10; opisthosomal: *c2* 48-56; *d* 34-38; *e* 14-19; *f* 22-27; *3a* 10-11; *h1* 7-8; *h2* 10-12; *h1* and *h2* 2-3.

Number of ventral annuli bearing setae: *c2* 9-11; *d* 19-24; *e* 34-38; *f* 52-59, 5 from rear.

Table 11

Parameters of infestation of *Aculodes dubius*. For legend see Table 2.

| Host species | *n* | *k* | *P* | *LCI* | *UCI* | *I* | *LCI* | *UCI* | *D* | *LCI* | *UCI* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. *Agropyron repens**** | 885 | 1 | 0.1 | 0.0 | 0.6 | - | - | - | 0.0 | 0.0 | 0.0 |
| 2. *Agrostis capillaris*** | 70 | 13 | 18.6 | 10.3 | 29.7 | 23.1 | 10.5 | 45.8 | 4.3 | 1.9 | 8.5 |
| 3. *Alopecurus aequalis** | 5 | 4 | 80.0 | 28.4 | 99.5 | 12.0 | 4.5 | 17.8 | 9.6 | 3.6 | 14.2 |
| 4. *Alopecurus pratensis*** | 70 | 5 | 7.1 | 2.4 | 15.9 | 17.0 | 6.2 | 36.6 | 1.2 | 0.4 | 2.6 |
| 5. *Arrhenantherum elatius*** | 496 | 44 | 8.9 | 6.5 | 11.7 | 22.3 | 13.8 | 37.9 | 2.0 | 1.2 | 3.4 |
| 6. *Bromus hordaceus** | 166 | 37 | 22.3 | 16.2 | 29.4 | 90.2 | 45.8 | 180.0 | 20.1 | 10.2 | 40.0 |
| 7. *Bromus inermis**** | 401 | 1 | 0.2 | 0.0 | 1.4 | - | - | - | 0.0 | 0.0 | 0.1 |
| 8. *Bromus sterilis*** | 75 | 10 | 13.3 | 6.6 | 23.2 | 34.4 | 13.0 | 79.7 | 4.6 | 1.7 | 10.6 |
| 9. *Bromus tectorum*** | 20 | 4 | 20.0 | 5.7 | 43.7 | 17.0 | 1.8 | 48.8 | 3.4 | 0.4 | 9.8 |
| 10. *Cynosurus cristatus** | 5 | 5 | 100.0 | 47.8 | 100.0 | 72.4 | 49.8 | 95.0 | 72.4 | 49.8 | 95.0 |
| 11. *Dactylis glomerata**** | 541 | 12 | 2.2 | 1.2 | 3.8 | 10.1 | 4.8 | 19.7 | 0.2 | 0.1 | 0.4 |
| 12. *Elymus arenarius** | 15 | 8 | 53.3 | 26.6 | 78.7 | 48.1 | 23.6 | 77.5 | 25.7 | 12.6 | 41.3 |
| 13. *Festuca pratensis**** | 65 | 3 | 4.6 | 1.0 | 12.9 | 12.7 | 0.0 | 30.0 | 0.6 | 0.0 | 1.4 |
| 14. *Festuca rubra**** | 682 | 14 | 2.1 | 1.1 | 3.4 | 13.5 | 7.4 | 24.4 | 0.3 | 0.2 | 0.5 |
| 15. *Holcus lanatus**** | 56 | 1 | 1.8 | 0.0 | 9.6 | - | - | - | 0.5 | 0.0 | 1.5 |
| 16. *Lolium perenne**** | 258 | 6 | 2.3 | 0.9 | 5.0 | 20.8 | 7.3 | 47.2 | 0.5 | 0.2 | 1.1 |
| 17. *Phleum nodosum** | 30 | 14 | 46.7 | 28.3 | 65.7 | 14.0 | 7.8 | 23.4 | 6.5 | 3.6 | 10.9 |
| 18. *Phleum pratense** | 110 | 30 | 27.3 | 19.2 | 36.6 | 112.0 | 52.2 | 229.0 | 30.6 | 14.2 | 62.3 |
| 19. *Poa annua** | 35 | 10 | 28.6 | 14.6 | 46.3 | 24.4 | 12.0 | 45.0 | 7.0 | 3.4 | 12.9 |
| 20. *Poa pratensis**** | 265 | 3 | 1.1 | 0.2 | 3.3 | 17.7 | 1.3 | 73.3 | 0.2 | 0.0 | 0.8 |

Larva (n=3) (Fig. 85): Body splinde-vermiform. Body length 142-143; width 39. Gnathosoma 18-23 long; chelicerae 17-18 long.

Prodorsal shield: 32-34 long, 32 wide. Triangular, without anterior lobe and lateral margins slender. Sculpture: median and admedian lines similar to that of female; I submedian lines on the posterior 1/3 of shield, parallel to admedian. Tubercles of setae *sc* ahead from posterior margin of shield, setae *sc* 12-13 long, 15 apart, projecting to center of shield.

Coxae: with few lines and microtubercles.

Opisthosoma with 38-40 dorsal annuli, 31 ventral annuli, 5-7 coxigenital annuli. Annuli with minute microtubercles: dorsal sparse, bead-like, slightly ahead of annuli margins; ventral conical, slightly ahead of annuli margins.

Leg I: 20-22; femur 6, seta *bv* 7-8; genu 3, seta *l"* 14-18; tibia 3, seta *l'* 6; tarsus 4, setae: *ft"* 17; *ft'* 15; solenidion $\omega$ 6; empodium 7, simple, 5–rayed, symmetrical. Position of setae: *bv* 3; *l"* 2; *l'* 1; *ft"* and *ft'* 1.

Leg II: 18-19; femur 5, *bv* 6-8; genu 3, *l"* 12; tibia 3; tarsus 4, *ft''* 15, *ft'* 7; solenidion $\omega$ 6; empodium 7, 5-rayed, symmetrical. Position of setae: *bv* 3; *l"* 2; *ft"* and *ft'* 2.

Length of setae: pedipalpal: *d* 5-6; *v* 2; *ep* 2; coxal: *1b* 5; *1a* 10; *2a* 20; opisthosomal: *c2* 12-15; *d* 10-19; *e* 11-13; *f* 15-17; *h1* 3-4; *3a* 7-9.

Distance between tubercles bearing setae: coxal: *1b* 12; *1a* 7; *2a* 19; *1b* and *1a* 6; *1a* and *2a* 7; opisthosomal: *d* 22; *e* 12; *f* 14; *3a* 6-7; *h1* 4; *h2* 6; *h1* and *h2* 2.

Number of ventral annuli bearing setae: *c2* 5-7; *d* 12; *e* 17-18; *f* 28, 4 from rear.

HOST PLANT

*Bromus hordaceus* L. Relation to host plant: vagrant on both leaf surfaces, under the leaf ligule, in leaf sheath; leaves often rolled.

MATERIAL

460 females, 59 males, 320 nymphs, 20 larvae from Poznań, Cytadela park, dry, roadside ditch [PC5], 13.04.1999, leg. AS.

Other records: *Alopecurus aequalis*: [PBP4] - 19.08.1998, (48); *Alopecurus pratensis*: [PC15] - 30.07.1999, (85); *Agropyron repens*: [MOG2] - 26.07.1998, (3); *Agrostis capillaris*: [PBP6] - 12.08.1998, (74); [OP4] - 11.06.2000, (190); [PLM2a] - 20.06.1999, (36); *Arrhenantherum elatius*: [PC13] - 31.08.1999, (57); 23.09.1999, (394); 29.01.2000, (48); [PC16] - 23.05.1999, (80); 20.06.1999, (25); [PC9] - 30.10.1999, (291); [PLM11] - 31.08.1999, (34); [PLM2] - 30.07.1999, (54); *Bromus hordaceus*: [BRP1] - 15.07.1998, (31); [OP5] - 12.06.1999, (1638); [PC5] - 25.02.1999, (25); [PC7] - 23.05.1999, (12); [PC13a] - 23.05.1999, (29); [PC18] - 31.08.1999, (30); [PLM1] - 23.05.1999, (19); [LGW1] - 14.06.1999, (57); [GLD2] - 23.04.2000, (32); *B. inermis*: [PLM12] - 30.04.1999, (7); *B. sterilis*: [PC7] - 23.05.1999, (20); [PC10] - 23.05.1999, (2000); [PC16] - 23.05.1999, (124); *B. tectorum*: [PLM02] - 22.05.1999, (68); *Cynosurus cristatus*:

[LUB1] - 11.06.2000, (362); *Dactylis glomerata*: [SWC1] - 24.06.1999, (53); [PBP8] - 16.10.1999, (68), leg. TR; *Elymus arenarius*: [MOS1] - 24.09.2000, (385); *Festuca pratensis*: [SWC1] - 24.06.1999, (38); *F.rubra*: [SWKO1] - 04.02.1999, (60); [SW1] - 04.02.1999, (12); 04.02.1999, (28); [SWC] - 18.02.1999, (37); [ME1] - 21.07.1999, (52); *Holcus lanatus*: [MOG1] - 26.07.1998, (28); *Lolium perenne*: [PBP1] - 19.08.1998, (30); [LGW1] - 14.06.1999, (95); *Phleum nodosum*: [SWC1] - 21.05.1999, (61); 24.06.1999, (114); 27.07.1999, (21); *P. pratense*: [PBP11] - 19.08.1998, (155); [SWC1] - 21.05.1999, (497); 21.05.1999, (55); 24.06.1999, (2390); 27.07.1999, (89); 27.07.1999, (161); [PC7] - 23.09.1999, (16); *Poa annua*: [PLM10] - 23.09.1999, (244); *P. pratensis*: [SWKO1] - 04.02.1999, (53).

ECOLOGICAL NOTES

Generalist with seven specific hosts, five accessory hosts, eight accidental hosts (Table 11; Fig. 86).

GENERAL DISTRIBUTION

Holarctic Region. The species was recorded in Europe and North America from at least 15 grass species (AMRINE & STASNY 1994) In Poland the species was previously recorded in the Wielkopolska region, the Upper Silesia region, Warsaw, from more than 20 species of grasses (BOCZEK et al. 1976; SKORACKA & BOCZEK 2000a; KOZŁOWSKI; SKORACKA & KOZŁOWSKI 2002).

## *Aculodes holcusi* n. sp.

DIAGNOSIS

Female. Typical shape of prodorsal shield; much more wider than long. Dorsal microtubercles large, subrounded and irregularly distributed.

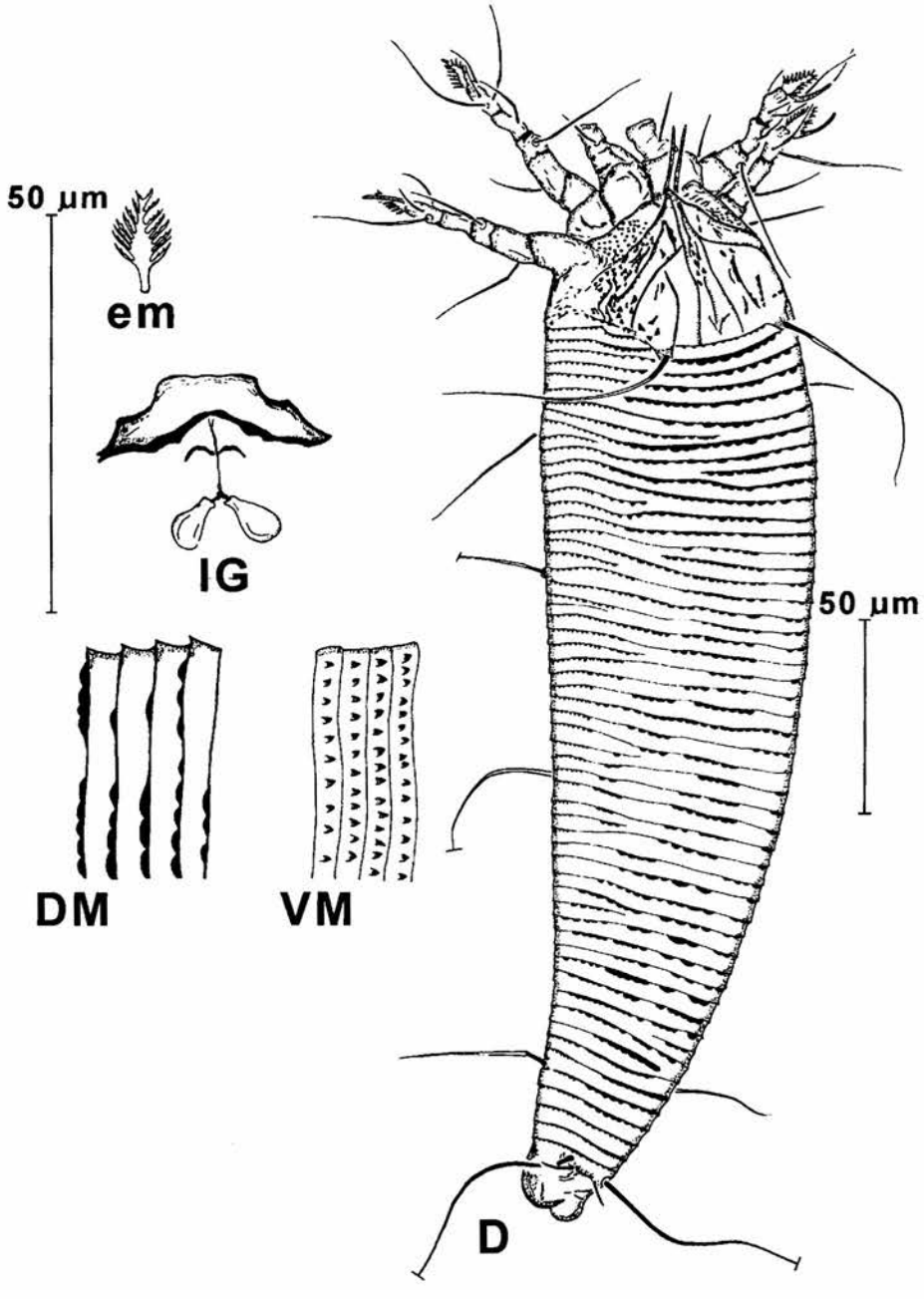
DESCRIPTION

Female (n=7) (Figs 87-88): Body spindleform. Body length 283 (280-289); width 67 (64-67). Gnathosoma 29 (29-31) long; chelicerae 24 (25-29) long.

Prodorsal shield: 41 (39-43) long, 51 (49-51) wide. Triangular with pointed lobe over cheliceral base. Sculpture: median line on rear half, below median line short lines forming V shaped figure; admedian lines complete, from anterior lobe diverging to lateral margin of shield; I submedian lines on rear half, parallel to admedian; II submedian lines arched, connecting with admedian in its 1/4 of length; subrounded and conical microtubercles and dashes present on shield. Tubercles of setae *sc* on rear margin of shield, setae *sc* 59 (58-65) long, 31 (29-30) apart, projecting to rear.

Coxae: with a pattern of wavy lines and dashes. Sternal line slender.

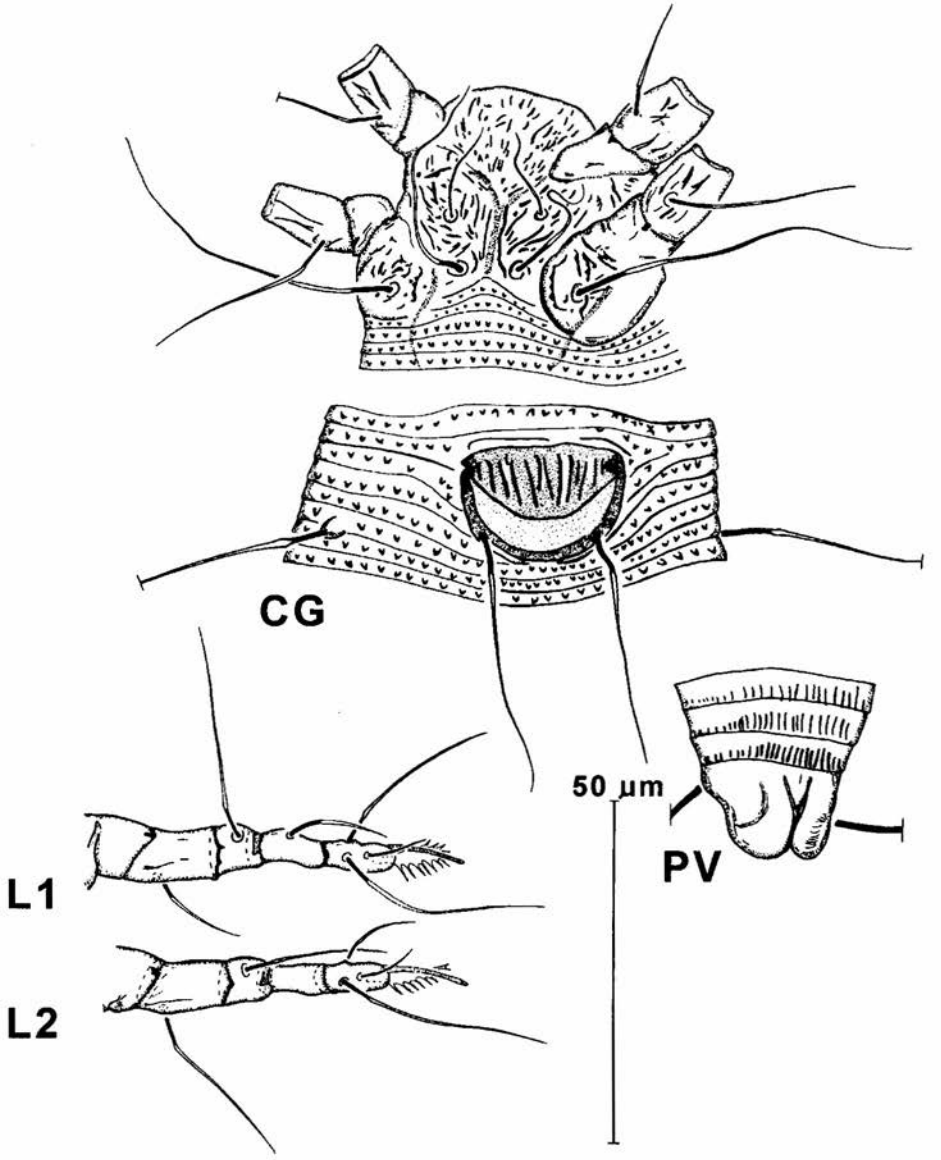
Opisthosoma with 50 (49-51) dorsal annuli, 63 (60-63) ventral annuli, 5 (5-6) coxigenital annuli. Annuli with microtubercles: dorsal irregularly distributed,



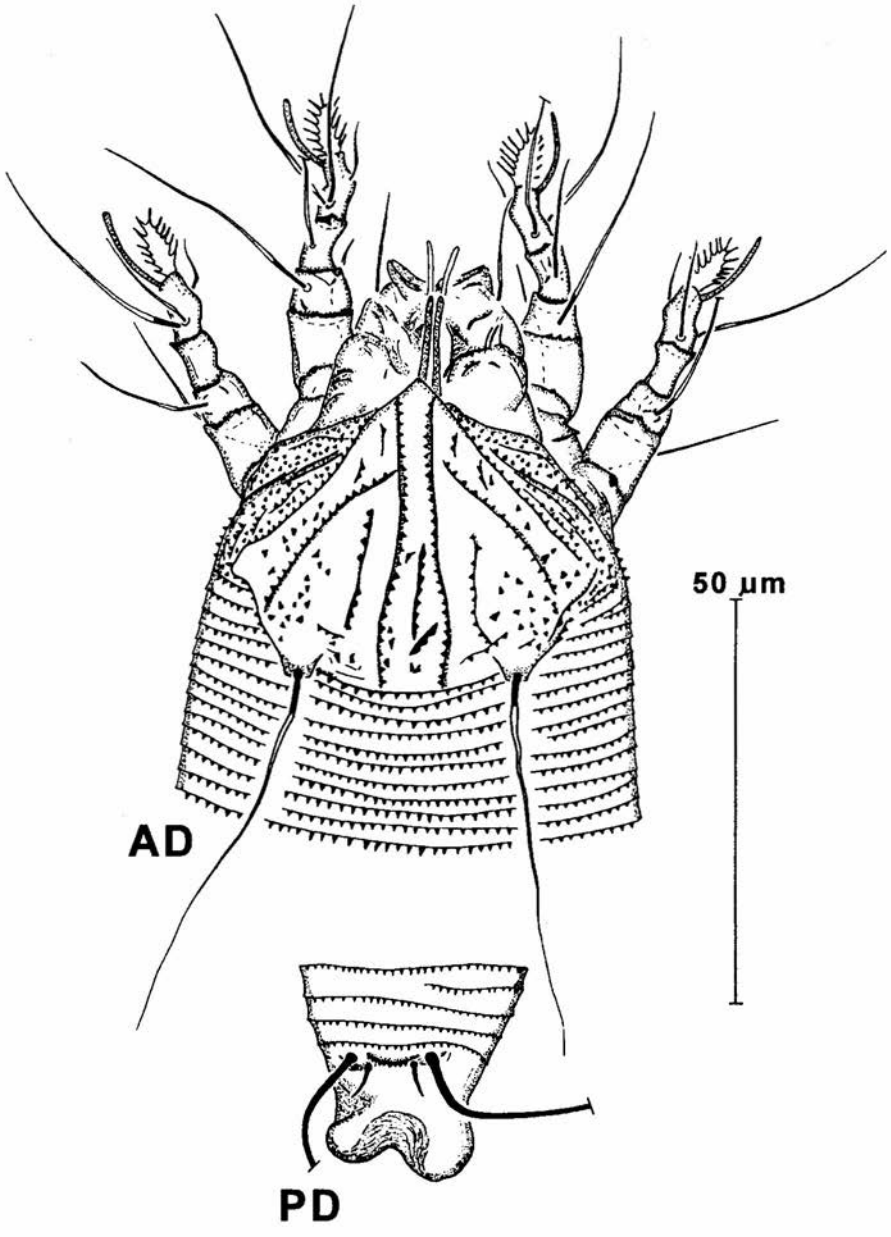

87. *Aculodes holcusi* n. sp., female: D – dorsal aspect, DM – dorsal microtubercles, IG – internal genitalia, VM – ventral microtubercles, em - empodium

large, subrounded, set along annuli margins, on telosomal annuli conical; ventral minute, conical, slightly pointed, ahead from annuli margins, on telosomal annuli elongated.

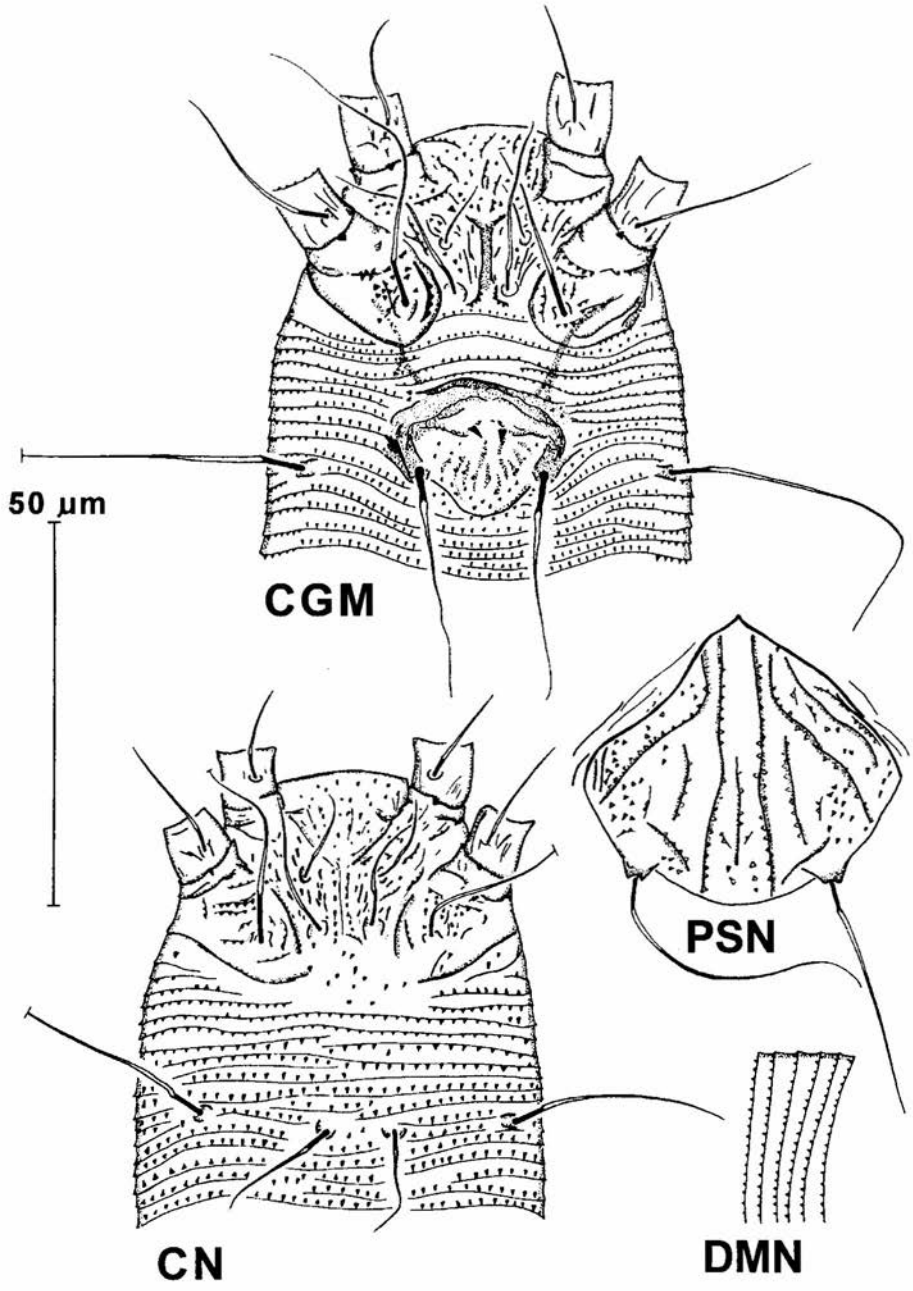
Leg I: 43 (44-47); femur 12 (12), seta *bv* 16 (14-16); genu 7 (6-7), seta *l''* 35 (30-33); tibia 7 (7-8), seta *l'* 14 (12-14); tarsus 10 (10), setae: *ft''* 27 (26-29);




88. *Aculodes holcusi* n. sp., female: CG – coxigenital region, PV – ventral telosome, L1, L2 – legs I and II




89. *Aculodes holcusi* n. sp., male: AD – antero-dorsal aspect, PD – dorsal telosome




90. *Aculodes holcusi* n. sp.: CGM – coxigenital region of male, CN - coxisternum and *3a* and *c2* setae of nymph, DMN – dorsal microtubercles of nymph, PSN – prodorsal shield of nymph

*ft'* 21 (20-21), *u'* 10 (10); solenidion *ω* 11 (11-12); empodium 11 (11-12), simple, 8 (8)-rayed, symmetrical. Position of setae: *bv* 5 (5); *l"* 4 (3); *l'* 4 (4-5); *ft"* and *ft'* 3 (3); *u'* 6 (6).

Leg II: 44 (43-45); femur 12 (12-13), *bv* 26 (26); genu 6 (6-7), *l"* 18 (17-18); tibia 8 (8-9); tarsus 10 (10), *ft"* 29 (29-32), *ft'* 10 (10-12), *u'* 6 (5-6); solenidion *ω* 11 (11); empodium 12 (12), 8 (8)-rayed, symmetrical. Position of setae: *bv* 5 (5); *l"* 4 (4); *ft"* and *ft'* 4 (4); *u'* 6 (6).

Genital parts 18 (17-18) long, 21 (21-25) wide, genital coverflap with 12 (11-12) longitudinal ribs.

Length of setae: pedipalpal: *d* 11 (11); *v* 2 (2); coxal: *1b* 10 (10-11); *1a* 29 (28-33); *2a* 48 (46-49); opisthosomal: *c2* 49 (47-49); *d* 62 (59-63); *e* 47 (48); *f* 37 (33-38); *3a* 40 (38-40); *h1* 5 (5-6); *h2* 95.

Distance between tubercles bearing setae: coxal: *1b* 12 (13); *1a* 8 (8-9); *2a* 27 (28); *1b* and *1a* 9 (8); *1a* and *2a* 10 (10); opisthosomal: *c2* 55 (54-56); *d* 40 (39-43); *e* 21 (21-22); *f* 25 (25); *3a* 15 (15-16); *h1* 7 (7); *h2* 11 (11); *h1* and *h2* 3 (2-3).

Number of ventral annuli bearing setae: *c2* 8 (8-11); *d* 21 (20-21); *e* 39 (37-39); *f* 59 (56), 5 (5) from rear.

Male (n=8) (Fig. 89-90): Body spindleform. Body length 200-254; width 52-57. Gnathosoma 22-26 long; chelicerae 17-19 long.

Prodorsal shield: 37-42 long, 40-44 wide. Triangularly-oval, with small, pointed lobe over cheliceral base. Sculpture: similar to that of female. Tubercles of setae *sc* on rear margin of shield, setae *sc* 40-49 long, 24-28 apart, projecting to rear.

Coxae: with a pattern similar to that of female.

Opisthosoma with 54-62 dorsal annuli, 64-72 ventral annuli, 5-6 coxigenital annuli. Annuli with conical microtubercles: dorsal pointed, set along annuli margins; ventral more narrow than dorsal, slightly ahead from annuli margins, on telosomal annuli elongated.

Leg I: 35-40; femur 10, seta *bv* 11-16; genu 5-6, seta *l"* 28-32; tibia 7-9, seta *l'* 10-13; tarsus 8-10, setae: *f"* 24-33; *ft'* 18-25, *u'* 6-7; solenidion *ω* 10; empodium 10-11, simple, 7-rayed, symmetrical. Position of setae: *bv* 4-5; *l"* 3; *l'* 4; *ft"* and *ft'* 2-3; *u'* 4-6.

Leg II: 34-38; femur 10-11, *bv* 21-27; genu 5-6, *l"* 14-17; tibia 6-7; tarsus 8-9, *ft"* 24-28, *ft'* 9-11, *u'* 6-7; solenidion *ω* 10-11; empodium 10-11, 6-rayed, symmetrical. Position of setae: *bv* 4-5; *l"* 3; *ft"* and *ft'* 2-3; *u'* 5.

Genital parts 16-17 long, 20-23 wide, surface below the eugenital setae with conical microtubercles.

Length of setae: pedipalpal: *d* 10-11; *v* 2; *ep* 3; coxal: *1b* 5-10; *1 a* 16-24; *2a* 38-49; opisthosomal: *c2* 38-59; *d* 45-62; *e* 31-47; *f* 29-38; *3a* 23-30; *h1* 4-6; *h2* 76-91.

Distance between tubercles bearing setae: coxal: *1b* 9-11; *1a* 6-8; *2a* 19-25; *1b* and *1a* 6-8; *1a* and *2a* 7-9; opisthosomal: *c2* 45-51; *d* 32-36; *e* 15-19; *f* 21-26; *3a* 16-19; *h1* 5-7; *h2* 9-10; *h1* and *h2* 2.

Number of ventral annuli bearing setae: *c2* 9-11; *d* 20-23; *e* 36-41; *f* 60-68, 5 from rear.

Nymph (n=4) (Fig. 90): Body spindleform. Body length 177-221, wide 51-61. Gnathosoma 18 long; chelicerae 19-20 long.

Prodorsal shield: 38 long, 39-40 wide. Triangularly-oval, with little and pointed anterior lobe over cheliceral base. Sculpture: similar to that of female with one exception: II submedian lines beginning near anterior lobe. Tubercles of setae *sc* on rear margin; setae *sc* 29-36 long, 26-29 apart, projecting to rear.

Opisthosoma with 55 dorsal annuli, 56 ventral annuli, 9 coxigenital annuli. Annuli with microtubercles: dorsal minute, conical, not pointed, set along annuli margins; ventral similar to that of male.

Leg I: 29-30; femur 7-9, seta *bv* 10-11; genu 4-5, seta *l''* 21-26; tibia 6, seta *l'* 7-8; tarsus 7, seta: *ft''* 16-18; *ft'* 20-21, *u'* 5-6; solenidion *ω* 7-8; empodium 10, simple, 6-7-rayed, symmetrical. Position of setae: *bv* 3-4; *l''* 2-3; *l'* 3; *ft''* and *ft'* 2; *u'* 4.

Leg II: 29-31; femur 8, *bv* 15-16; genu 4, *l''* 11; tibia 5; tarsus 7, *ft''* 19-23, *ft'* 11, *u'* 5; solenidion *ω* 8-9; empodium 9-10, 6-7-rayed, symmetrical. Position of setae: *bv* 3-4; *l''* 2-3; *ft''* and *ft'* 2; *u'* 4.

Length of setae: pedipalpal: *d* 8-9; *v* 2; coxal: *1b* 6-7; *1a* 17-22; *2a* 21; opisthosomal: *c2* 27-38; *d* 31-34; *e* 23-28; *f* 19-25; *3a* 12-15; *h1* 4-5.

Distance between tubercles bearing setae: coxal: *1b* 10; *1a* 7-9; *2a* 22-24; *1b* and *1a* 7-8; *1a* and *2a* 8; opisthosomal: *c2* 41; *d* 28-34; *e* 15-18; *f* 21-23; *3a* 9-10; *h1* 5-6; *h2* 9-11; *h1* and *h2* 2.

Number of ventral annuli bearing setae: *c2* 11; *d* 22; *e* 35; *f* 52, 5 from rear.

Larva not found.

HOST PLANT

*Holcus mollis* L. Relation to host plant: vagrant on upper leaf surfaces, mainly near the top; leaves discoloured.

TYPE MATERIAL

Female holotype, 26 female paratypes, 31 male paratypes, 19 nymph paratypes.

TYPE LOCALITY

Beskid Sądecki Mts., Przechyba, 1173 asl, mountain meadow with south exposition [BSP3], 25.08.1999, leg. AS.

ETYMOLOGY

The specific designation is derived from the *Holcus* – the generic name of type host plant.

ECOLOGICAL NOTES

Specialist I on *H. mollis*. The values of infestation ($n$=10; $k$=4): $P$=40.0% (*Cl:* 12.2%-73.8%); $I$=24.0 (*Cl*: 6.5-46.3) specimens per shoot; $D$=9.6 (*Cl*: 2.6-18.5) specimens per shoot.

## *Aculodes mckenziei* (KEIFER, 1944)

*Vasates mckenziei* KEIFER, 1944
*Aculodes mckenziei* ssp. *mckenziei* (KEIFER, 1944)

DESCRIPTION

Female (n=15) (Figs 91-93): Body spindleform. Body length 240-331; width 62-74. Gnathosoma 26-30, chelicerae 22-27 long.

Prodorsal shield: 46-49 long, 38-52 wide. Triangular with large, pointed lobe over cheliceral base. Sculpture: median line on rear half; admedian lines complete, diverging from base of anterior lobe to rear margin; I submedian lines subparallel to admedian lines, running laterally just in front of tubercles of *sc* setae; II submedian lines on rear 3/4, subparallel to lateral margin of shield; large, conical and pointed microtubercles present on rear half. Tubercles of setae *sc* on rear margin of shield, setae *sc* 47-64 long, 28-35 apart, projecting to rear. Minute, conical microtubercles present on surface near shield.

Coxae: with a pattern of numerous lines and conical microtubercles. Sternal line slender.

Opisthosoma with 60-71 dorsal annuli, 69-81 ventral annuli, 5-8 coxigenital annuli. Annuli with conical and pointed microtubercles set along annuli margins: dorsal numerous, on telosomal annuli minute, ventral smaller than dorsal, on telosomal annuli elongated.

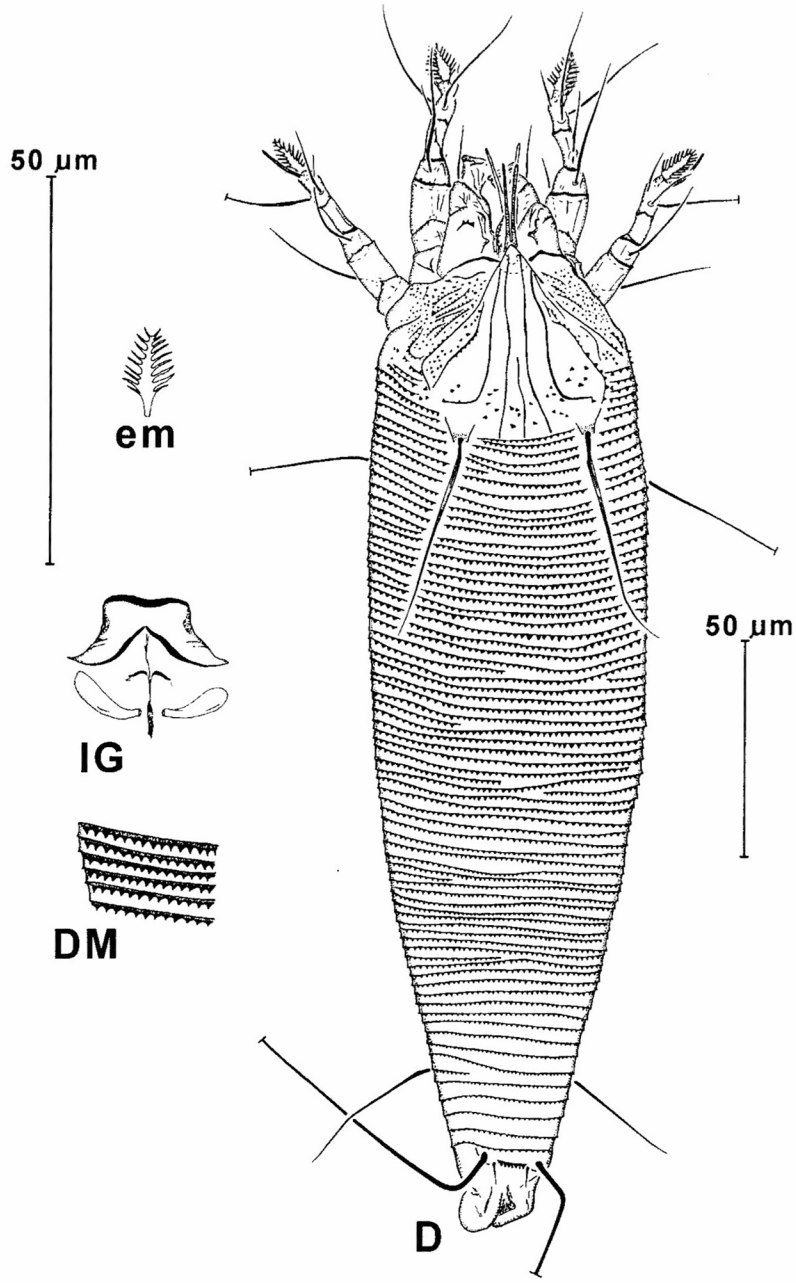
Leg I: 41-49; femur 10-12, seta *bv* 16-20; genu 6-7, seta *l"* 30-36; tibia 9-11, seta *l'*-11-15; tarsus 9-10, setae: *ft"* 28-34; *ft'* 26-32, *u'* 5-10; solenidion $\omega$ 10-12; empodium 11-13, simple, 9-rayed, symmetrical. Position of setae: *bv* 5-6; *l"* 3-4; *l'* 4-6; *ft"* and *ft'* 3; *u'* 5-7.

Leg II: 40-47; femur 11-13, *bv* 27-30; genu 5-6, *l"* 17-26; tibia 8-9; tarsus 8-10, *ft"* 27-31, *ft'* 11-18, *u'* 8-9; solenidion $\omega$ 10-12; empodium 11-13, 9-rayed, symmetrical. Position of setae: *bv* 5-6; *l"* 3-4; *ft"* and *ft'* 2-3; *u'* 5-7.

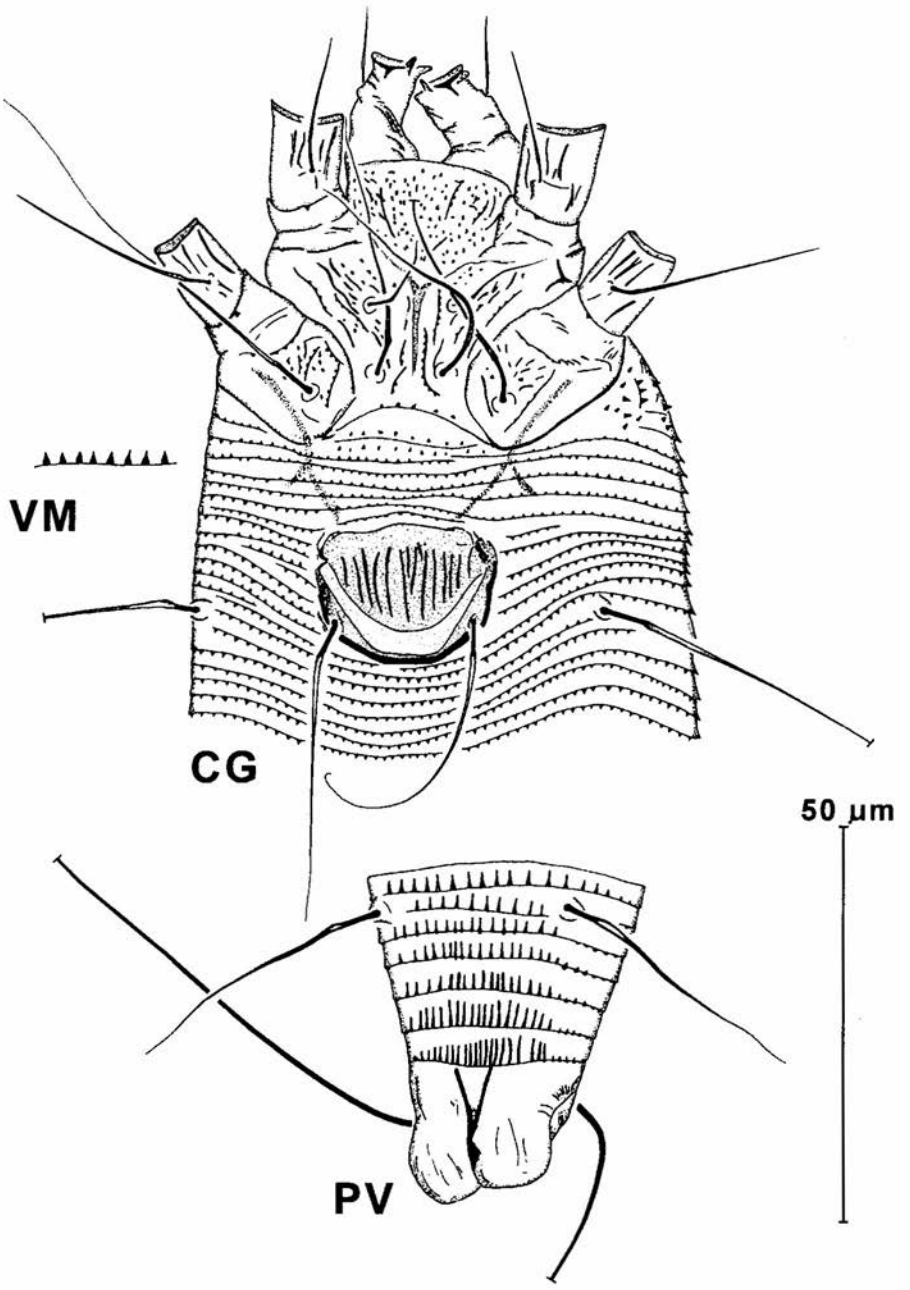
Genital parts 17-21 long, 23-27 wide, genital coverflap with 11-15 longitudinal ribs.

Length of setae: pedipalpal: *d* 10-13; *v* 2-3; *ep* 3-4; coxal: *1b* 8-13; *1a* 27-41; *2a* 46-61; opisthosomal: *c2* 50-67; *d* 62-82; *e* 36-48; *f* 34-40; *h1* 5-7; *h2* 81-113; *3a* 38-50.

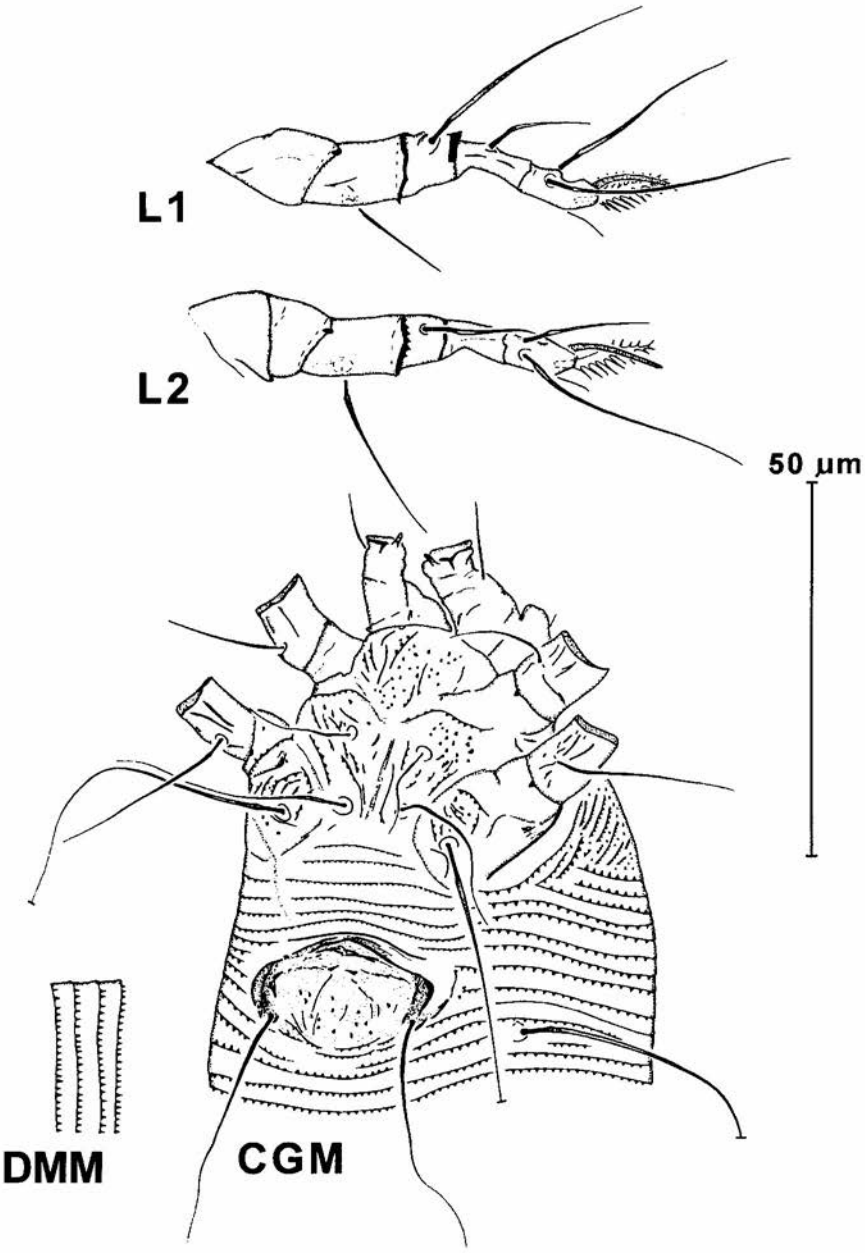
Distance between tubercles bearing setae: coxal: *1b* 10-12; *1a* 8-10; *2a* 25-30; *1b* and *1a* 9-10; *1a* and *2a* 9-10; opisthosomal: *c2* 52-66; *d* 33-48; *e* 17-27; *f* 24-28; *3a* 16-19; *h1* 7-9; *h2* 11-13; *h1* and *h2* 2-3.




91. *Aculodes mckenziei* (KEIFER), female: D – dorsal aspect, DM – dorsal microtubercles, IG – internal genitalia, em - empodium




92. *Aculodes mckenziei* (KEIFER), female: CG – coxigenital region, PV – ventral telosome, VM – ventral microtubercles

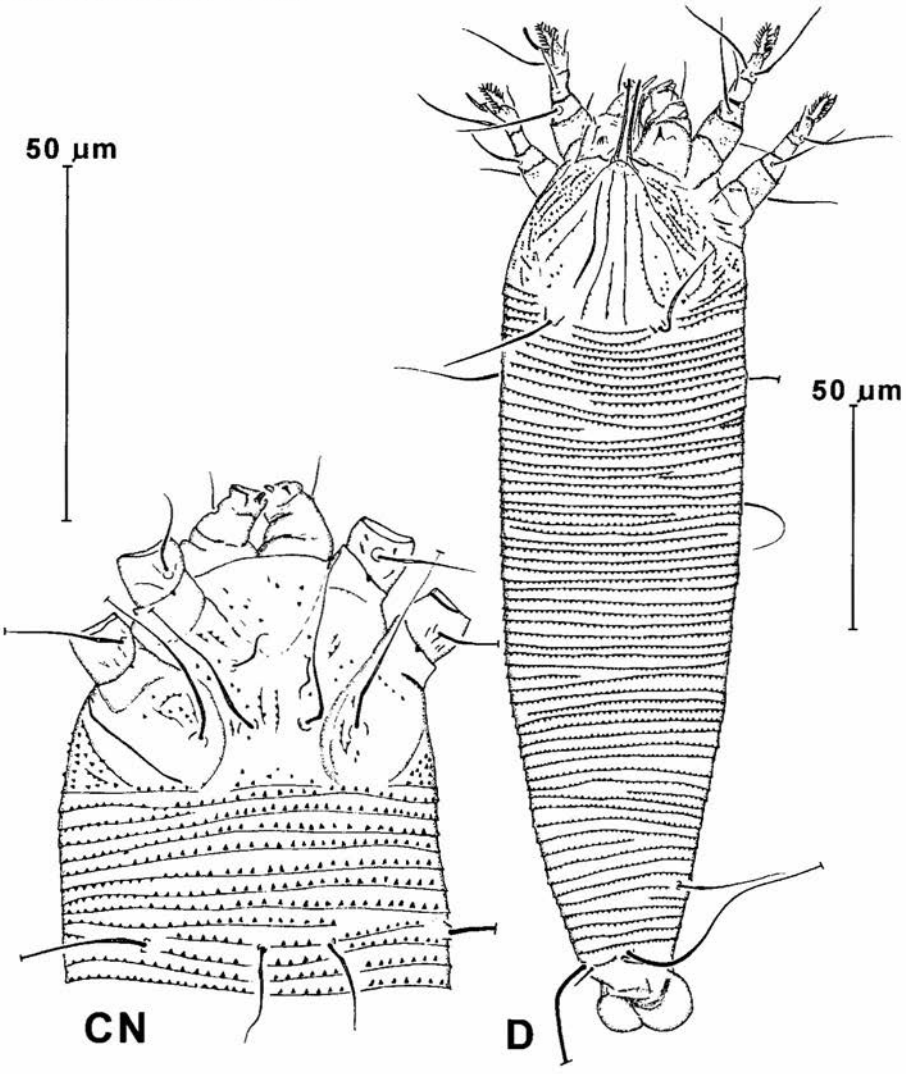



93. *Aculodes mckenziei* (KEIFER): CGM – coxigenital region of male, DMM – dorsal microtubercles of male, L1, L2 – legs I and II of female

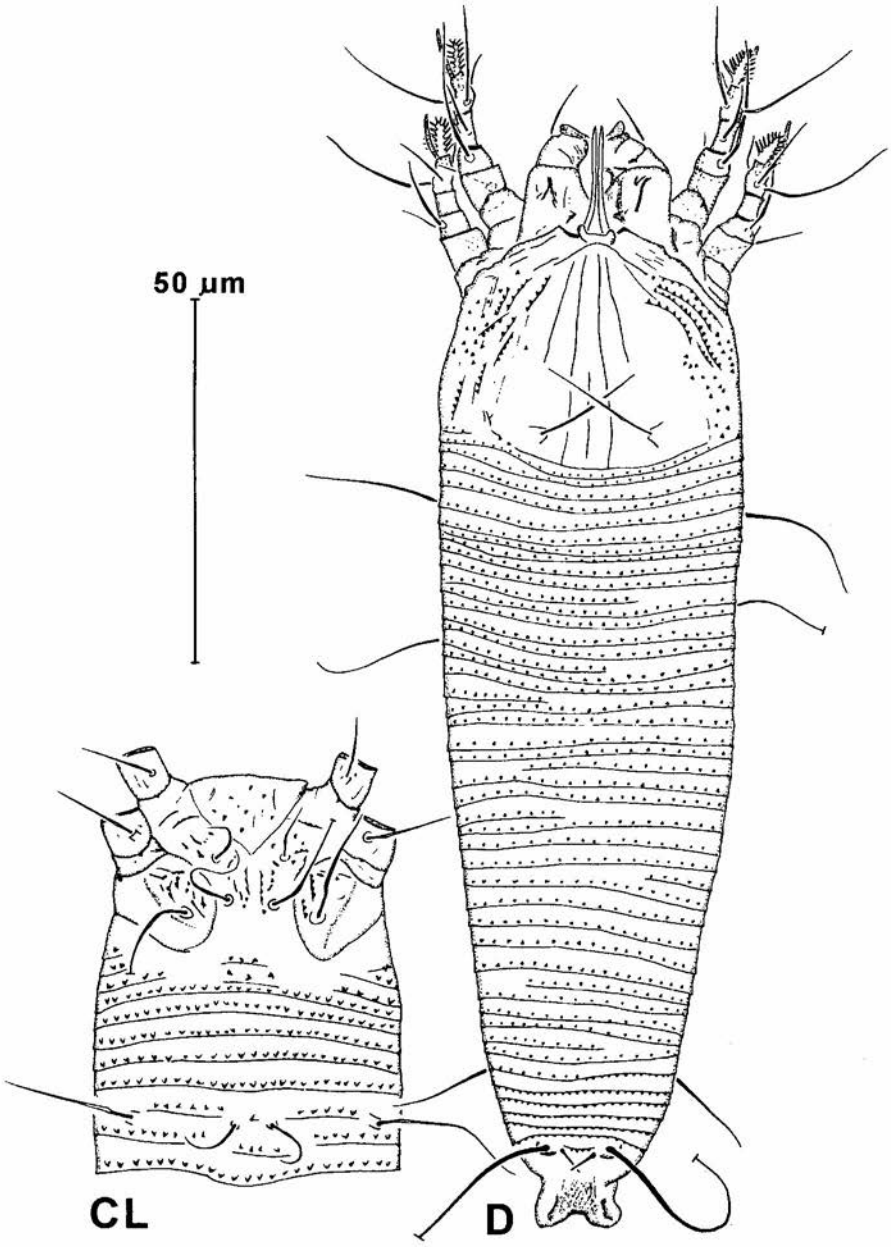
Number of ventral annuli bearing setae: *c2* 8-11; *d* 22-26; *e* 41-48; *f* 65-77, 5-6 from rear.

Male (n=9): Body spindleform. Body length 217-254; width 51-61. Gnathosoma 24-29 long; chelicerae 21-24 long.

Prodorsal shield: 36-45 long, 40-43 wide. Shape and sculpture similar to that of female. Tubercles of setae *sc* on rear margin of shield, setae *sc* 35-43 long, 27-31 apart, projecting to rear.




94. *Aculodes mckenziei* (KEIFER), nymph: CN - coxisternum and *3a* and *c2* setae, D – dorsal aspect




95. *Aculodes mckenziei* (KEIFER), larva: CL - coxisternum and *3a* and *c2* setae, D – dorsal aspect

Coxae: with a pattern similar to that of female (Fig. 93).

Opisthosoma with 56-63 dorsal annuli, 59-69 ventral annuli, 5-6 coxigenital annuli. Annuli with conical and pointed microtubercles, set along annuli margins: dorsal smaller than these of female (Fig. 93).

Leg I: 36-42; femur 10-11, seta *bv* 13-19; genu 6, seta *l"* 28-31; tibia 8-9, seta *l'* 11-12; tarsus 8-10, setae: *ft"* 26-31; *ft'* 23-27, *u'* 7-9; solenidion *ω* 10-11; empodium 10-12, simple, 7-8-rayed, symmetrical. Position of setae: *bv* 4-5; *l"* 3-4; *l'* 4-5; *ft"* and *ft'* 2-3; *u'* 5-7.

Leg II: 34-40; femur 10-11, *bv* 21-29; genu 5-6, *l"* 16-21; tibia 7; tarsus 8-9, *ft"* 26-30, *ft'* 11-17, *u'* 7-8; solenidion *ω* 10-12; empodium 11-12, 7-8-rayed, symmetrical. Position of setae: *bv* 4-5; *l''* 3-4; *ft"* and *ft'* 2-3; *u'* 5-6.

Genital parts 16-20 long, 22-24 wide, surface below the eugenital setae with few subrounded microtubercles (Fig. 93).

Length of setae: pedipalpal: *d* 8-12; *v* 2; *ep* 3-4; coxal: *1b* 8-13; *1a* 26-33; *2a* 45-57; opisthosomal: *c2* 48-55; *d* 46-64; *e* 30-46; *f* 26-36; *h1* 4-6; *h2* 85; *3a* 27-45.

Distance between tubercles bearing setae: coxal: *1b* 9-11; *1a* 8-9; *2a* 22-26; *1b* and *1a* 7-10; *1a* and *2a* 8-10; opisthosomal: *c2* 48-50; *d* 30-38; *e* 15-19; *f* 22-26; *3a* 17-19; *h1* 6-8; *h2* 10-12; *h1* and *h2* 2.

Number of ventral annuli bearing setae: *c2* 7-9; *d* 18-20; *e* 35-38; *f* 57-65, 5 from rear.

Nymph (n=5) (Fig. 94): Body spindleform. Body length 171-231; width 54-57. Gnathosoma 23-37 long; chelicerae 20-22 long.

Prodorsal shield: 36-42 long, 38-41 wide. Triangularly-oval, with anterior lobe subrounded, reaching half of cheliceral base. Sculpture: similar to that of female. Tubercles of setae *sc* on rear margin of shield, setae *sc* 23-29 long, 20-26 apart, projecting to rear. Surface near prodorsal shield with minute, conical microtubercles.

Coxae: with a pattern of few lines and conical microtubercles.

Opisthosoma with 53-57 dorsal annuli, 58-59 ventral annuli, 10 coxigenital annuli. Annuli with conical microtubercles set along annuli margins, ventral larger than dorsal.

Leg I: 31-37; femur 7-8, seta *bv* 10-14; genu 5-6, seta *l"* 24-26; tibia 7-8, seta *l'* 7-10; tarsus 7, seta: *ft"* 23-25; *ft'* 19-23, *u'* 5-6; solenidion *ω* 7-8; empodium 8-10, simple, 7-8–rayed, symmetrical. Position of setae: *bv* 3-4; *l"* 3; *l'* 3-4; *ft"* and *ft'* 2-3; *u'* 4.

Leg II: 27-35; femur 8-9, *bv* 16-21; genu 4-5, *l"* 13-16; tibia 5-6; tarsus 7-8, *ft"* 21-23, *ft'* 8-15, *u'* 5-6; solenidion *ω* 8-10; empodium 8-10, 7-8-rayed, symmetrical. Position of setae: *bv* 4; *l''* 2-3; *ft"* and *ft'* 2-3; *u'* 4.

Length of setae: pedipalpal: *d* 8-10; *v* 2; coxal: *1b* 8; *1a* 24; *2a* 23-25; opisthosomal: *c2* 28-35; *d* 30-43; *e* 27-30; *f* 24-29; *3a* 13-15; *h1* 4; *h2* 73.

Distance between tubercles bearing setae: coxal: *1b* 10; *1a* 8; *2a* 23-25; *1b* and *1a* 9; *1a* and *2a* 8-10; opisthosomal: *c2* 43-48; *d* 28-32; *e* 14-16; *f* 20-24; *3a* 9-10; *h1* 6-7; *h2* 10; *h1* and *h2* 2.

Number of ventral annuli bearing setae: *c2* 10; *d* 22-23; *e* 36-39; *f* 54-55, 5 from rear.

Larva (n=4) (Fig. 95): Body splinde-vermiform. Body length 128-177; width 37-47. Gnathosoma 16-20 long; chelicerae 16-18 long.

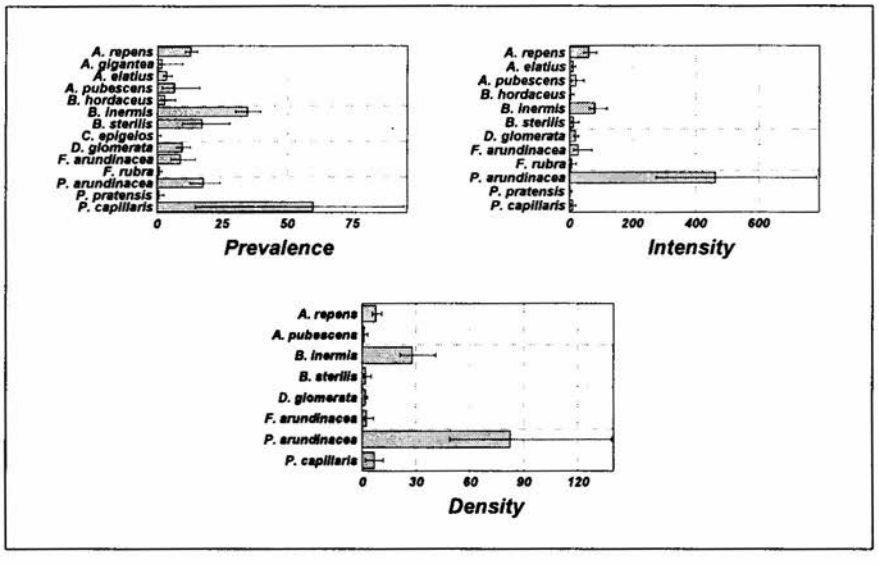
Prodorsal shield: 29-33 long, 27-31 wide. Ovally-triangular, without anterior lobe and lateral margins slender. Sculpture: median and admedian lines similar to that of female; I submedian lines on posterior half, parallel to admedian. Tubercles of setae *sc* ahead from posterior margin of shield, setae *sc* 13-15 long, 13-17 apart, projecting to center of shield.

Coxae: few lines with subrounded microtubercles. Sternal line absent.

Opisthosoma with 40-43 dorsal annuli, 32-34 ventral annuli, 6-8 coxigenital annuli. Annuli with conical microtubercles: dorsal ahead of annuli margins, on rear 3-4 annuli subrounded; ventral pointed, ahead of annuli margins.

Leg I: 21-27; femur 6-7, seta *bv* 8-9; genu 4, seta *l"* 16-18; tibia 4-5, seta *l'* 6-8; tarsus 4-5, seta: *ft"* 17; *ft'* 11-16; *u'* 4-5; solenidion *ω* 6-8; empodium 7-8, simple, 6–rayed, symmetrical. Position of setae: *bv* 3; *l"* 2-3; *l'* 2; *ft"* and *ft'* 2; *u'* 3-4.

Leg II: 20-25; femur 6, *bv* 11-12; genu 3-4, *l"* 9-11; tibia 3; tarsus 5, *ft"* 17, *ft'* 7-8; *u'* 4-5; solenidion *ω* 6-7; empodium 7-9, 6-rayed, symmetrical. Position of setae: *bv* 3-4; *l"* 2; *ft"* and *ft'* 2; *u'* 3.




96. Prevalence, intensity and density of infestation of *Aculodes mckenziei* on grass species. For generic names of grasses see the text

Length of setae: pedipalpal: *d* 6-7; *v* 2; *ep* 3; coxal: *1b* 5-7; *1a* 14-16; opisthosomal: *c2* 20-24; *d* 19-27; *e* 11-15; *f* 14-19; *h1* 3-4; *h2* 62; *3a* 6-7.

Distance between tubercles bearing setae: coxal: *1b* 8-10; *1a* 6-8; *2a* 17-19; *1b* and *1a* 7; *1a* and *2a* 6-8; opisthosomal: *c2* 31-40; *d* 20-25; *e* 10-13; *f* 16-19; *3a* 6-8; *h1* 5; *h2* 9; *h1* and *h2* 2.

Number of ventral annuli bearing setae: *c2* 6-8; *d* 12-14; *e* 8-19; *f* 30-31, 4 from rear.

HOST PLANT

*Bromus inermis* LEYSS. Relation to host plant: vagrant on both leaf surfaces, under the leaf ligules and near the bases of leaves; leaves often rolled.

MATERIAL

199 females, 55 males, 65 nymphs, 24 larvae Poznań, Lasek Marceliński forest, roadside near allotment gardens [PLM12], 23.05.1999, leg. AS.

Table 12

Parameters of infestation of *Aculodes mckenziei*. For legend see Table 2.

| Host species | *n* | *k* | *P* | *LCI* | *UCI* | *I* | *LCI* | *UCI* | *D* | *LCI* | *UCI* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. *Agropyron repens** | 885 | 114 | 12.9 | 10.7 | 15.3 | 60.5 | 43.9 | 84.7 | 7.8 | 5.7 | 10.9 |
| 2. *Agrostis gigantea**** | 55 | 1 | 1.8 | 0.0 | 9.7 | - | - | - | 0.3 | 0.0 | 0.8 |
| 3. *Arrhenantherum elatius**** | 496 | 18 | 3.6 | 2.2 | 5.7 | 11.7 | 6.8 | 19.2 | 0.4 | 0.2 | 0.7 |
| 4. *Avenula pubescens*** | 60 | 4 | 6.7 | 1.9 | 16.2 | 19.3 | 5.3 | 45.8 | 1.3 | 0.4 | 3.1 |
| 5. *Bromus hordaceus**** | 166 | 5 | 3.0 | 1.0 | 6.9 | 4.6 | 1.2 | 12.6 | 0.1 | 0.0 | 0.4 |
| 6. *Bromus inermis** | 401 | 139 | 34.7 | 30.0 | 39.5 | 81.0 | 61.1 | 119.0 | 28.1 | 21.2 | 41.2 |
| 7. *Bromus sterilis*** | 75 | 13 | 17.3 | 9.6 | 27.8 | 12.5 | 5.9 | 29.4 | 2.2 | 1.0 | 5.1 |
| 8. *Calamagrostis epigeios**** | 397 | 1 | 0.3 | 0.0 | 1.4 | - | - | - | 0.1 | 0.0 | 0.2 |
| 9. *Dactylis glomerata*** | 541 | 53 | 9.8 | 7.4 | 12.6 | 20.1 | 14.3 | 28.3 | 2.0 | 1.4 | 2.8 |
| 10. *Festuca arundinacea*** | 165 | 15 | 9.1 | 5.2 | 14.6 | 28.5 | 13.3 | 70.7 | 2.6 | 1.2 | 6.4 |
| 11. *Festuca rubra**** | 682 | 6 | 0.9 | 0.3 | 1.9 | 7.0 | 2.0 | 20.5 | 0.1 | 0.0 | 0.2 |
| 12. *Phalaris arundinacea** | 185 | 33 | 17.8 | 12.6 | 24.1 | 463.0 | 274.0 | 781.0 | 82.6 | 48.8 | 139.0 |
| 13. *Poa pratensis**** | 265 | 2 | 0.8 | 0.1 | 2.7 | 2.5 | 0.0 | 7.5 | 0.0 | 0.0 | 0.1 |
| 14. *Puccinellia capillaris** | 5 | 3 | 60.0 | 14.7 | 94.7 | 11.7 | 3.0 | 19.7 | 7.0 | 1.8 | 11.8 |

Other records: *Agropyron repens*: [SLG1] - 12.07.1998, (7); 12.07.1998, (12); [MOG2] - 26.07.1998, (59); 26.07.1998, (24); [PLD] - 31.01.1999, (8); [PC4] - 25.02.1999, (40); [PC6] - 28.02.2000, (362); [PC7] - 25.02.1999, (59); 20.06.1999, (37); [PC13] - 23.05.1999, (95); 30.07.1999, (885); 31.08.1999, (99); 23.09.1999, (108); 28.02.2000, (24); [PLM10] - 30.04.1999, (39); 20.06.1999, (28); 30.07.1999, (21); 31.08.1999, (1975); 23.09.1999, (1891); 23.10.1999, (273); 28.11.1999, (483); 27.12.1999, (57); 22.01.2000, (123); 29.03.2000, (70); [PLM2] - 30.04.1999, (78); [SWKO1] – 4.02.1999, (40); *Agrostis gigantea*: [PLM02] - 19.07.1998, (14); *Arrhenantherum elatius*: [MOG2] - 26.07.1998, (19); [PC9] - 29.01.2000, (120); [PC13] - 20.06.1999, (33); [PC13a] - 31.08.1999, (38); *Avenula pubescens*: [PC13] - 27.12.1999, (77); *Bromus hordaceus*: [PLM17] – 30.07.1999, (23); *B. inermis*: [PLM12] - 30.04.1999, (23); 30.07.1999, (192); 31.08.1999, (2106); 23.09.1999, (225); 28.11.1999, (72); 27.12.1999, (271); 22.01.2000, (237); 29.02.2000, (73); 29.03.2000, (80); [PLM1] - 20.06.1999, (1459); [PC13] - 13.04.1999, (61); 23.05.1999, (883); 31.08.1999, (676); 23.09.1999, (1747); 30.10.1999, (382); 28.11.1999, (938); 27.12.1999, (121); 29.01.2000, (110); 28.02.2000, (17); [OW2] - 26.04.2001, (73); *B. sterilis*: [PC16] - 23.05.1999, (82); [PC7] - 23.05.1999, (37); [PLM10] - 23.05.1999, (44); *Calamagrostis epigeios*: [PBP3] - 12.08.1998, (20); *Dactylis glomerata*: [ZAD3] - 4.08.1998, (36); [PC6] - 25.02.1999, (60); 23.05.1999, (64); 30.07.1999, (188); 23.09.1999, (63); 30.10.1999, (96); 28.11.1999, (32); 29.01.2000, (75); 29.03.2000, (58); [PC13] - 23.09.1999, (130); [PLM2a] - 20.06.1999, (11); [PLM12] - 23.09.1999, (17); 23.10.1999, (201); 23.10.1999, (274); 23.10.1999, (901); [BIA1] - 1.05.2000, (35); *Festuca arundinacea*: [PLM12] - 30.07.1999, (353); [PC13a] - 27.12.1999, (75); *F. rubra*: [PLM3] - 20.06.1999, (9); 29.03.2000, (12); [PLM2] - 23.10.1999, (21); *Phalaris arundinacea*: [PC6] - 31.08.1999, (8); 23.09.1999, (3666); 28.11.1999, (9478); [PLM2] - 23.10.1999, (2026); [SLN1] - 8.09.2000, (105); *Poa pratensis*: [PLM3] - 20.06.1999, (5); *Puccinellia capillaris*: [SWINP] - 5.09.1999, (35), leg. ML.

ECOLOGICAL NOTES

Generalist, with four specific hosts, four accessory hosts, six accidental hosts (Table 12; Figure 96).

GENERAL DISTRIBUTION

Holarctic Region. The species was recorded in Europe and North America from at least 10 grass species (AMRINE & STASNY 1994). In Poland it was previously recorded in the Wielkopolska region, the Upper Silesia region, Warsaw from more than 20 species of grasses (BOCZEK et al. 1976; KOZŁOWSKI 2001; SKORACKA & BOCZEK 2000a; SKORACKA & KOZŁOWSKI 2002).

## *Aculodes multitricavus* n. sp.

DIAGNOSIS

Female. Typical sculpture of prodorsal shield, with many triangular cavities. Dorsal and ventral microtubercles similar: minute, conical and pointed. I empodial claw 9-rayed.

DESCRIPTION

Female (n=6) (Figs 97-98): Body spindleform. Body length 240 (238-251); width 59 (57-60). Gnathosoma 24 (24-25) long; chelicerae 24 (22-24) long.

Prodorsal shield: 42 (41-45) long, 39 (39-40) wide. Triangular with long, pointed lobe over cheliceral base. Sculpture: median line on rear half; admedian lines complete, from anterior lobe diverging to lateral margin of shield; I submedian lines short, on rear half, parallel to admedian; II submedian lines begining on 4/5 rear part of shield, parallel to lateral margins; numerous triangular cavities present on shield. Tubercles of setae *sc* on rear margin of shield, setae *sc* 27 (26-32) long, 25 (20-24) apart, projecting to rear.

Coxae: with a pattern of lines on I coxae and dashes and conical microtubercles on II coxae. Sternal line distinct.

Opisthosoma with 60 (58-60) dorsal annuli, 66 (62-67) ventral annuli, 6 (5-6) coxigenital annuli. Dorsal and ventral annuli with minute, conical and pointed microtubercles set along annuli margins, on telosomal annuli elongated.

Leg I: 38 (37-38); femur 9 (9-10), seta *bv* 12 (12-15); genu 6 (6-7), seta *l"* 28 (28-29); tibia 8 (8-10), seta *l'* 11 (11-12); tarsus 7 (7-8), setae: *ft"* 25 (25-27); *ft'* 22 (20-22), *u'* 6 (6-7); solenidion $\omega$ 10 (10); empodium 10 (10-11), simple, 9 (9)-rayed, symmetrical. Position of setae: *bv* 5 (5); *l"* 3 (3-4); *l'* 4 (4-5); *ft"* and *ft'* 2 (2-3); *u'* 5 (5).

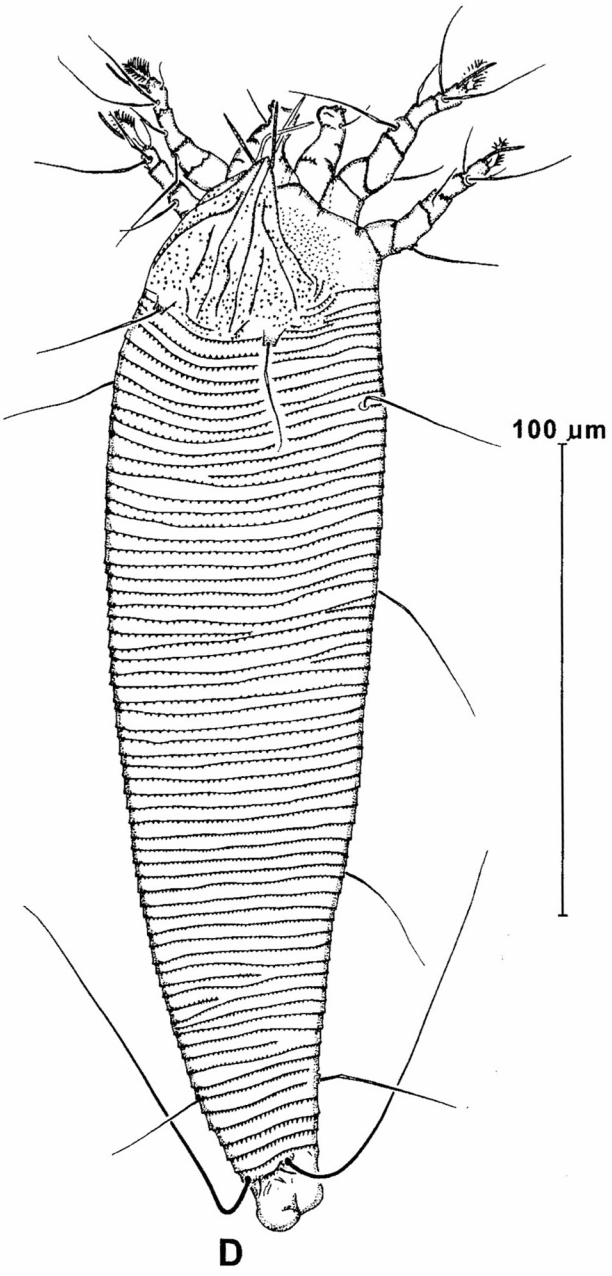
Leg II: 35 (35-36); femur 10 (10-11), *bv* 20 (20-23); genu 5 (5-6), *l"* 9 (9-14); tibia 6 (6-7); tarsus 8 (8), *ft"* 26 (25-26), *ft'* 8 (8-10), *u'* 7 (6-7); solenidion $\omega$ 11 (11); empodium 9 (9-10), 8 (8)-rayed, symmetrical. Position of setae: *bv* 5 (4-5); *l"* 3 (3); *ft"* and *ft'* 2 (2-3); *u'* 5 (5).

Genital parts 15 (15-16) long, 17 (17-21) wide, genital coverflap with 13 (12-13) longitudinal ribs.

Length of setae: pedipalpal: *d* 8 (8-10); *v* 2 (2); coxal: *1b* 14 (10-14); *1a* 18 (20-29); *2a* 35 (33-40); opisthosomal: *c2* 33 (28-34); *d* 49 (48-49); *e* 42 (38); *f* 30 (26-31); *3a* 34 (32-35); *h1* 4 (4-5); *h2* 59.

Distance between tubercles bearing setae: coxal: *1b* 10 (10-11); *1a* 7 (7); *2a* 20 (20-23); *1b* and *1a* 7 (7); *1a* and *2a* 8 (8-9); opisthosomal: *c2* 49 (48-49); *d* 34 (35-40); *e* 17 (16-21); *f* 19 (18-20); *3a* 13 (13-15); *h1* 6 (5-6); *h2* 9 (9-10); *h1* and *h2* 2 (2).

Number of ventral annuli bearing setae: *c2* 8 (8); *d* 21 (20-21); *e* 40 (37-39); *f* 62 (58-63), 4 (4-5) from rear.



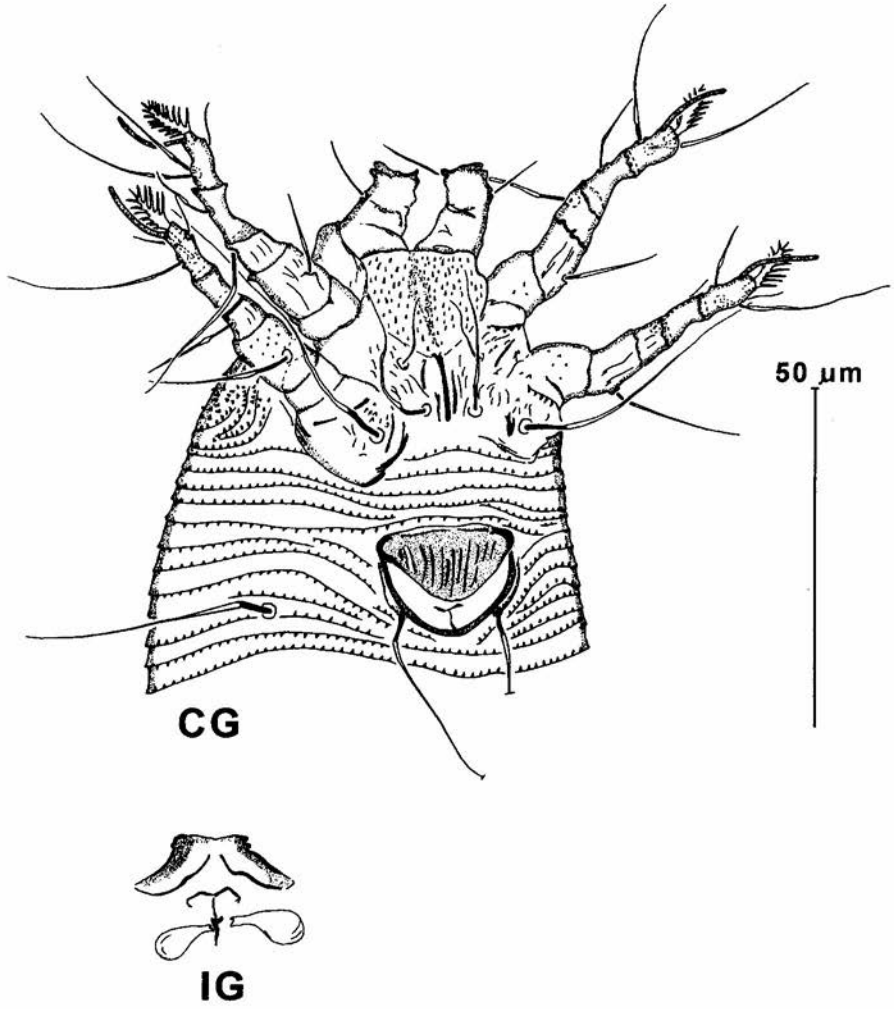

97. *Aculodes multitricavus* n. sp., female: D – dorsal aspect

Male (n=4) (Fig. 99): Body spindleform. Body length 188-193; width 45-47. Gnathosoma 22-24 long; chelicerae 19-21 long.

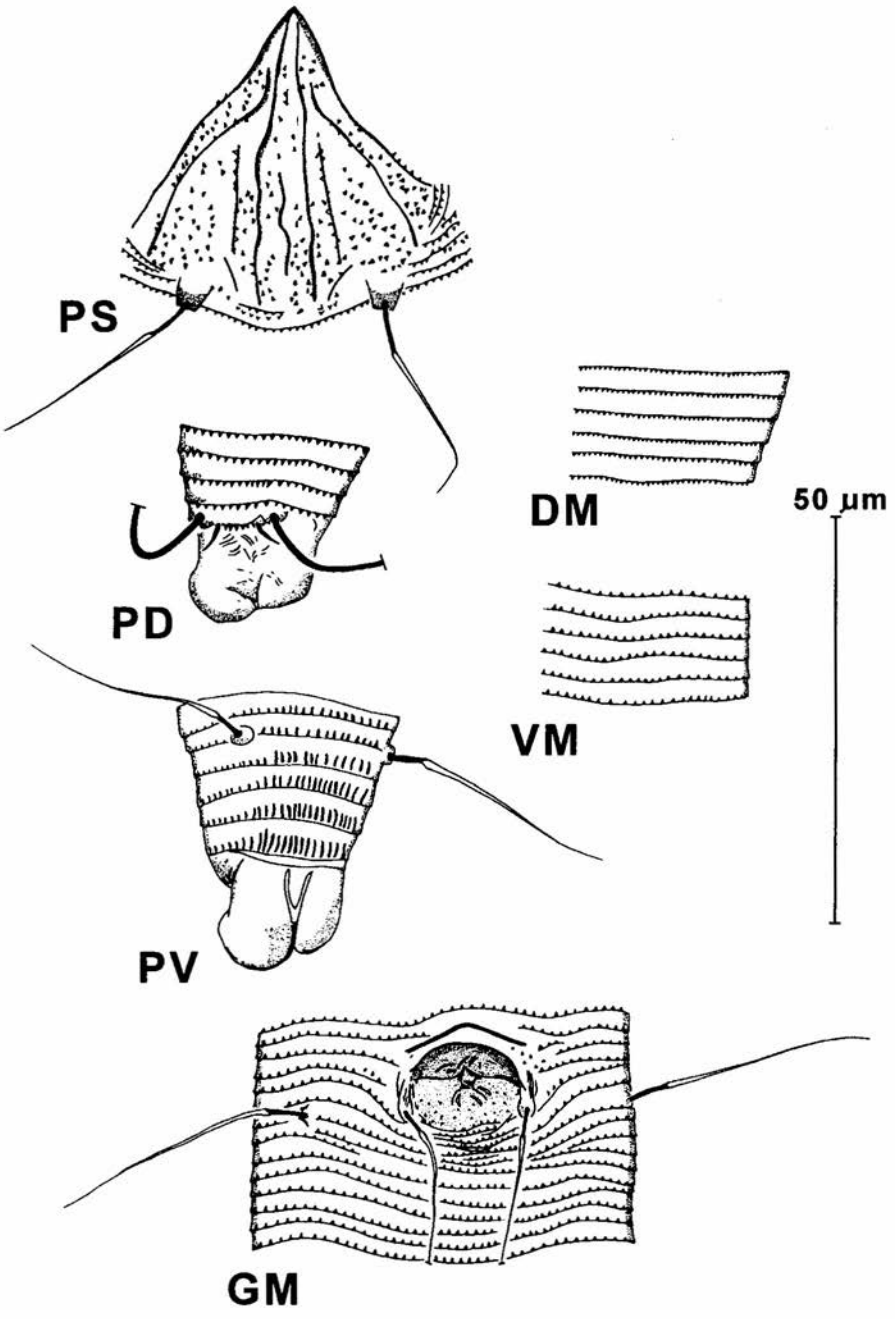
Prodorsal shield: 33-37 long, 33-37 wide. Triangular, with long, pointed lobe over cheliceral base. Sculpture: similar to that of female. Tubercles of setae *sc* on rear margin of shield, setae *sc* 24 long, 21-26 apart, projecting to rear.

Coxae: with a pattern of dashes.

Opisthosoma with 58-61 dorsal annuli, 62-63 ventral annuli, 6-8 coxigenital annuli. Annuli with microtubercles similar to that of female.




98. *Aculodes multitricavus* n. sp., female: CG – coxigenital region and legs, IG – internal genitalia




99. *Aculodes multitricavus* n. sp., male: DM – dorsal microtubercles, GM – genital region, PD – dorsal telosoma, PS – prodorsal shield, PV – ventral telosoma, VM – ventral microtubercles

Leg I: 26-31; femur 9, seta *bv* 10-14; genu 5-6, seta *l"* 22-24; tibia 5-7, seta *l'* 7-8; tarsus 6-7, setae: *ft"* 21-27; *ft'* 14-18, *u'* 6-7; solenidion *ω* 9; empodium 9-10, simple, 6-7-rayed, symmetrical. Position of setae: *bv* 3; *l"* 3-4; *l'* 3-4; *ft"* and *ft'* 2; *u'* 4.

Leg II: 25-28; femur 8, *bv* 16-18; genu 4-5, *l"* 15; tibia 5; tarsus 6-7, *ft"* 21, *ft'* 11, *u'* 6-7; solenidion *ω* 9-10; empodium 10, 6-rayed, symmetrical. Position of setae: *bv* 3-4; *l"* 3; *ft"* and *ft'* 2; *u'* 4.

Genital parts 13 long, 17-18 wide, surface below the eugenital setae with minute, triangular cavities.

Length of setae: pedipalpal: *d* 6; *v* 2; *ep* 4; coxal: *1b* 6-7; *1 a* 15-19; *2a* 35; opisthosomal: *c2* 29-34; *d* 38-40; *e* 28-30; *f* 23; *3a* 41-43; *h1* 3; *h2* 66.

Distance between tubercles bearing setae: coxal: *1b* 9; *1a* 6; *2a* 17-18; *1b* and *1a* 6; *1a* and *2a* 7; opisthosomal: *c2* 41; *d* 27-28; *e* 14-15; *f* 17-20; *3a* 14-15; *h1* 6; *h2* 8-9; *h1* and *h2* 2.

Number of ventral annuli bearing setae: *c2* 8-9; *d* 19; *e* 36-37; *f* 58-59, 4 from rear.

Nymph, larva not found.

HOST PLANT

*Bromus inermis* LEYSS. Relation to host plant: vagrant on upper leaf surfaces; no visible damages.

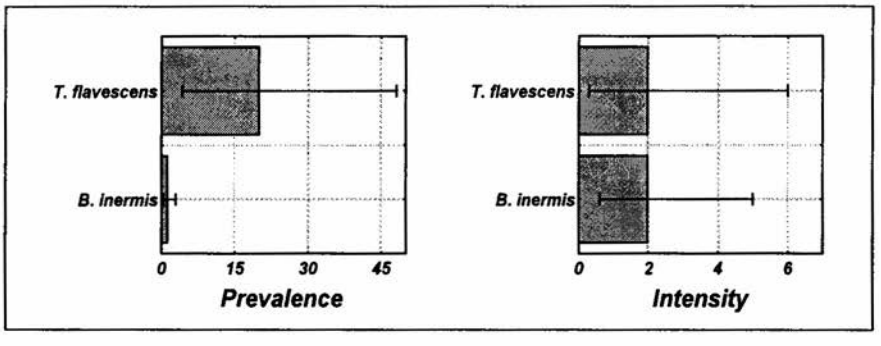
TYPE MATERIAL

Female holotype, 16 female paratypes, 12 male paratypes.

Type locality: Owczary, xerothermic sward [OW2], 07.09.2000, leg. AS.

ETYMOLOGY

The specific designation is derived from the *multum* (lat.) – many, *triangulum* (lat.) – triangle, *cavos* (lat.) – cavity, because of many of triangular cavities on prodorsal shield.




100. Prevalence and intensity of infestation of *Aculodes multitricavus* on *Trisetum flavescens* and *Bromus inermis*

OTHER RECORDS

*Trisetum flavescens*: [OW2] - 26.04.2001, (26).

ECOLOGICAL NOTES

Species found on two host species, both of which are accidental (Table 13; Fig. 100).

Table 13

Parameters of infestation of *Aculodes multitricavus*. For legend see Table 2.

| Host species | *n* | *k* | *P* | *LCI* | *UCI* | *I* | *LCI* | *UCI* | *D* | *LCI* | *UCI* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. *Bromus inermis**** | 401 | 5 | 1.3 | 0.4 | 2.9 | 2.0 | 0.6 | 5.0 | 0.0 | 0.0 | 0.1 |
| 2. *Trisetum flavescens**** | 15 | 3 | 20.0 | 4.3 | 48.1 | 2.0 | 0.3 | 6.0 | 0.4 | 0.1 | 1.2 |

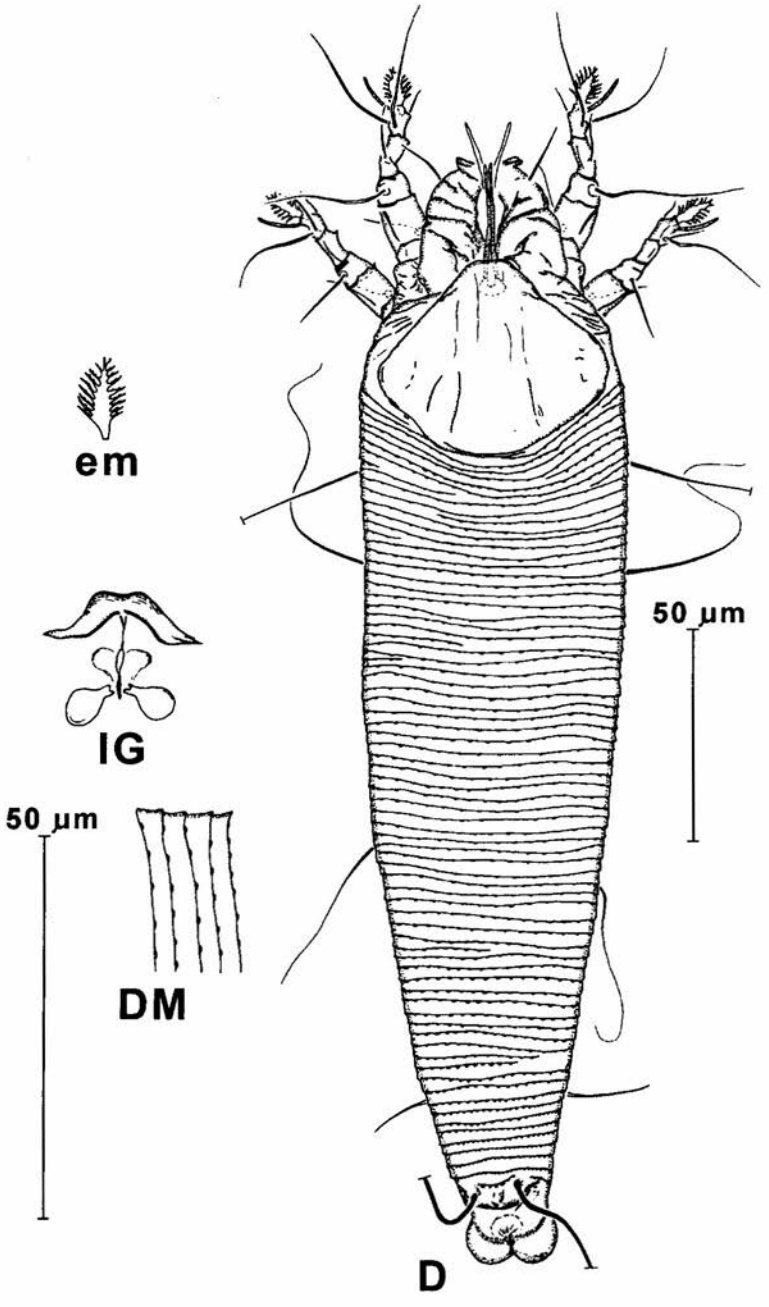
## Tribe: Calacarini AMRINE et STASNY, 1994
## *Jaranasia* CHANDRAPATYA et BOCZEK, 2000

### *Jaranasia sesleriae* n. sp.

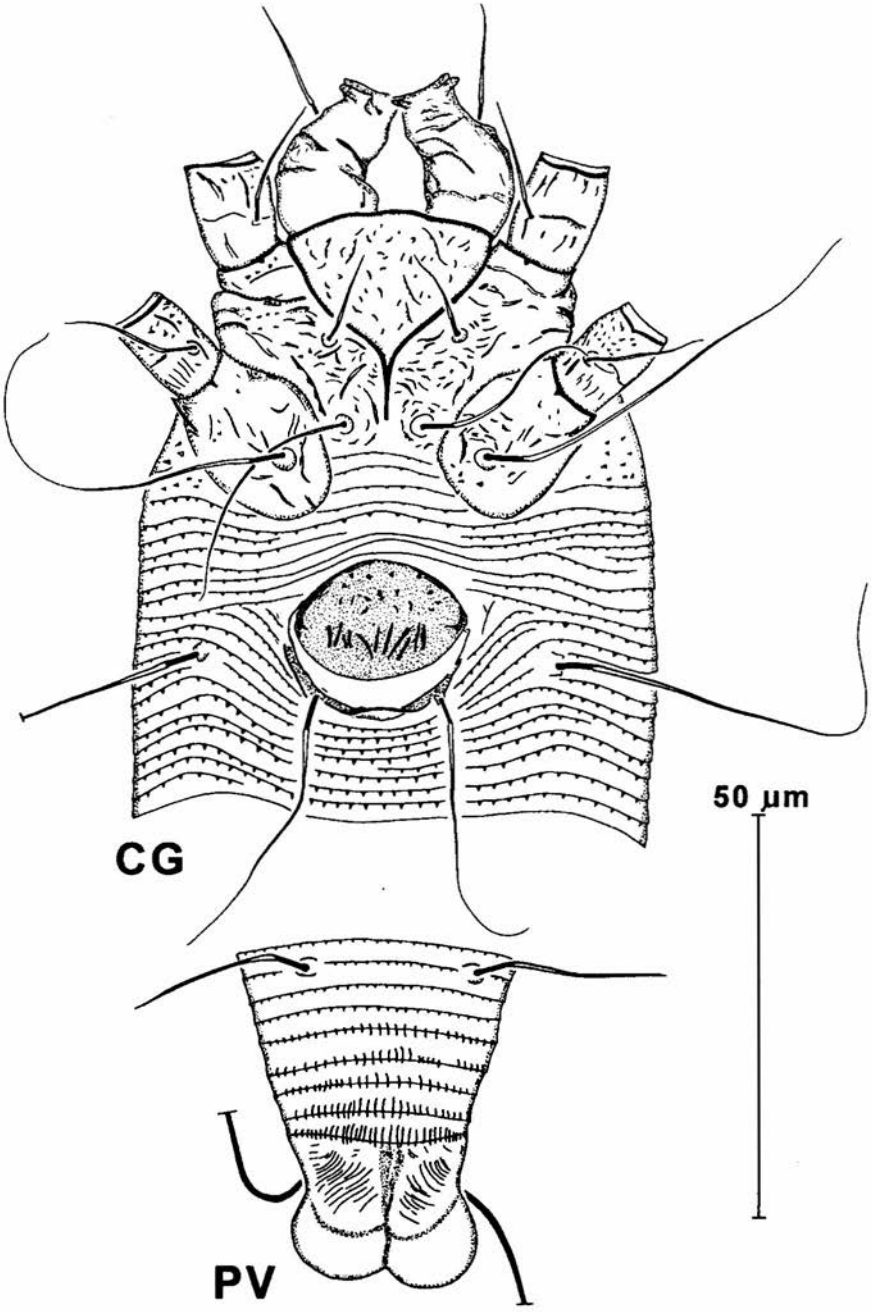
DIAGNOSIS

Female: *Jaranasia anamensiae* CHANDRAPATYA et BOCZEK, 2000 (*Parinari anamenis* HANCE, Rosaceae, Thailand) is the only species of this genus described up to date. Similarities between *Jaranasia seslariae* and *J. anamensiae* are: the absence of *h1* setae, unknobbed solenidia and microtuberculate opisthosomal annuli.

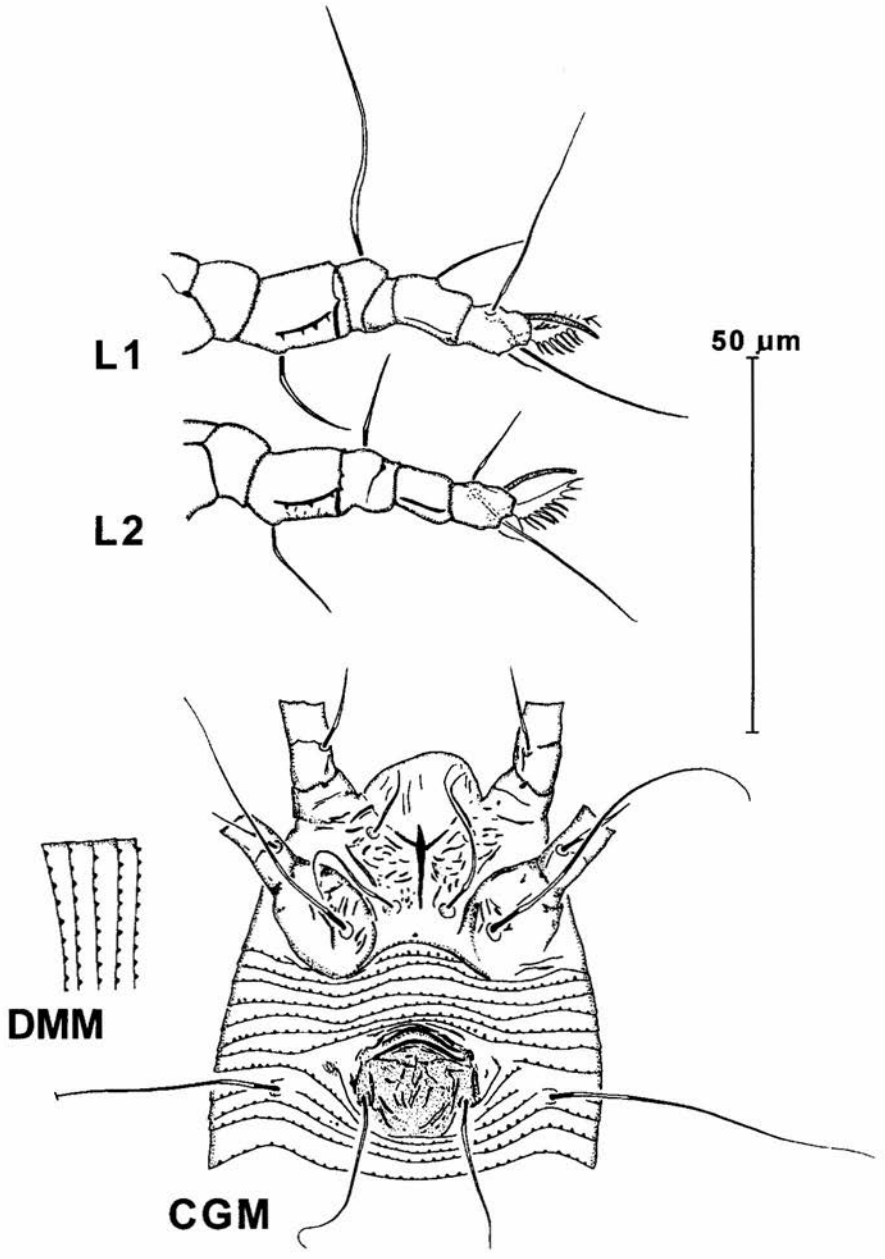
*J. sesleriae* can be distinguished from *J. anamensiae* by the shape of the anterior lobe of prodorsal shield and the sculpture of prodorsal shield. In *J. anamensiae* the prodorsal shield is subtriangular, with rounded anterior lobe and sculpture of several cells forming proximal and distal bands, median line is present. In *J. sesleriae* prodorsal shield is ovally-trapezoidal with blunted anterior lobe and slender design of sculpture, without median line and cells. Those two species differ also in the sculpture of genital coverflap (of longitudinal striae in *J. anamensiae*, of longitudinal striae posteriorly and microtubercles anteriorly in *J. sesleriae*), the number of empodial rays (6 in *J. anamensiae*, 8-9 in *J. sesleriae*) and the length of setae: *c2* (13 in *J. anamensiae*, 56 in *J. sesleriae*), *e* (10 in *J. anamensiae*, 50 in *J. sesleriae*) and tibial *l"* (30 in *J. anamensiae*, 11 in *J. sesleriae*).



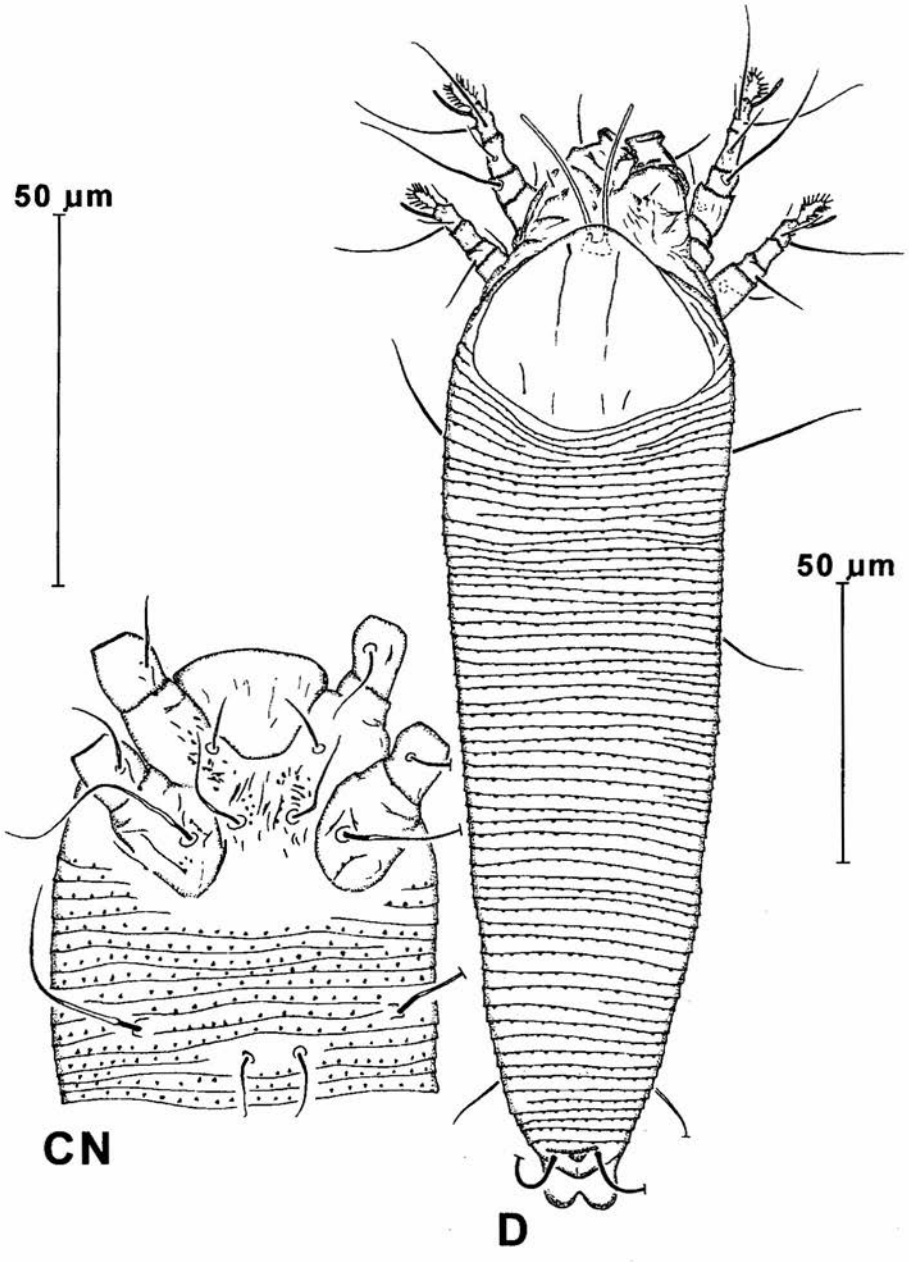

101. *Jaranasia sesleriae* n. sp., female: D – dorsal aspect, DM – dorsal microtubercles, IG – internal genitalia, em - empodium




102. *Jaranasia sesleriae* n. sp., female: CG – coxigenital region, PV – ventral telosome




103. *Jaranasia sesleriae* n. sp.: CGM – coxigenital region of male, DMM – dorsal microtubercles of male, L1, L2 – legs I and II of female




104. *Jaranasia sesleriae* n. sp., nymph: CN - coxisternum and *3a* and *c2* setae, D – dorsal aspect

DESCRIPTION

Female (n=14) (Figs 101-103): Body spindleform. Body length 256 (233 291); width 64 (62-72). Gnathosoma 35 (30-40) long; chelicerae 32 (29-33) long.

Prodorsal shield: 48 (48-51) long, 48 (48-54) wide. Ovally-trapezoidal, with large and blunted lobe over gnathosoma. Sculpture: slender, almost invisible: median line absent; admedian lines complete, parallel to each other; I submedian lines on 1/3 rear part, parallel to admedian. Tubercles bearing setae *sc* and setae *sc* absent. Surface near shield with few lines with minute microtubercles.

Coxae: with a pattern of numerous dashes and minute microtubercles. Sternal line marked, anteriorly split.

Opisthosoma with 73 (67-81) dorsal annuli, 83 (72-87) ventral annuli, 7 (5-9) coxigenital annuli. Annuli with microtubercles set along annuli margins: dorsal scarce, bead-like, on some annuli hiden, almost invisible, on telosomal annuli minute; ventral minute, conical, pointed, more numerous than dorsal, on telosomal annuli elongated.

Leg I: 46 (43-52); femur 14 (8-14), seta *bv* 13 (12-17); genu 7 (6-8), seta *l''* 38 (34-44); tibia 11 (10-11), seta *l'* 11 (11-15); tarsus 8 (7-9), setae: *ft''* 35 (29-34); *ft'* 32 (29-31), *u'* 6 (6-8); solenidion *ω* 10 (10); empodium 11 (10-13), simple, 9 (8-9)-rayed, symmetrical. Position of setae: *bv* 5 (5-6); *l''* 4 (4-5); *l'* 5 (4-6); *ft''* and *ft'* 3 (2-3); *u'* 5 (5-6).

Leg II: 43 (38-48); femur 12 (11-13), *bv* 15 (13-19); genu 5 (5-7), *l''* 15 (14-17); tibia 9 (8-9); tarsus 8 (7-8), *ft''* 29 (23-30), *ft'* 10 (9-16), *u'* 6 (6-9); solenidion *ω* 10 (10-11); empodium 11 (10-12), 8 (8-9)-rayed, symmetrical. Position of setae: *bv* 6 (5-7); *l''* 3 (3-4); *ft''* and *ft'* 2 (2); *u'* 5 (4-5).

Genital parts 20 (18-20) long, 22 (21-24) wide, genital coverflap anteriorly with conical microtubercles, posteriorly with 11 (6-14) longitudinal ribs.

Anal lobes ventrally with numerous lines.

Length of setae: pedipalpal: *d* 13 (13-15); *ep* 3 (2-3); coxal: *1b* 10 (10-14); *1a* 29 (19-30); *2a* 48 (48-52); opisthosomal: *c2* 56 (48-61); *d* 71 (67-73); *e* 50 (50-63); *f* 26 (22-27); *3a* 30 (29-36); *h2* 90 (71-90). Setae *h1* absent.

Distance between tubercles bearing setae: coxal: *1b* 15 (14-17); *1a* 9 (8-12); *2a* 25 (23-30); *1b* and *1a* 11 (10-13); *1a* and *2a* 8 (8-10); opisthosomal: *c2* 46 (43-54); *d* 32 (29-36); *e* 21 (21-27); *f* 20 (17-21); *3a* 14 (14-16); *h2* 11 (10-11).

Number of ventral annuli bearing setae: *c2* 11 (10-12); *d* 25 (22-28); *e* 44 (42-49); *f* 76 (66-79), 8 (7-9) from rear.

Male (n=4): Body spindleform, more slender than that of female. Body length 203-219; width 52-60. Gnathosoma 29 long; chelicerae 27-29 long.

Prodorsal shield: 41-42 long, 42 wide. Shape and sculpture similar to that of female. Tubercles of setae *sc* and setae *sc* absent.

Coxae: with a pattern of lines and dashes. Sternal line marked (Fig. 103).

Opisthosoma with 52-62 dorsal annuli, 61-70 ventral annuli, 5-7 coxigenital annuli. Annuli with conical, not pointed microtubercles: dorsal minute, set along annuli margins; ventral more minute than dorsal, slightly ahead of annuli margins.

Leg I: 37-38; femur 10-11, seta *bv* 12-13; genu 6-7, seta *l"* 28-35; tibia 10, seta *l'* 9-11; tarsus 7-8, setae: *ft"* 28-30; *ft'* 25-29, *u'* 5-6; solenidion *ω* 10; empodium 10, simple, 7-rayed, symmetrical. Position of setae: *bv* 4-5; *l"* 3-4; *l'* 4; *ft"* and *ft'* 2; *u'* 4-5.

Leg II: 33-34; femur 10, *bv* 11-13; genu 5-6, *l"* 13-14; tibia 7-8; tarsus 6-7, *ft"* 26-29, *ft'* 10, *u'* 4-6; solenidion *ω* 9-10; empodium 10, 7-rayed, symmetrical. Position of setae: *bv* 5; *l"* 3; *ft"* and *ft'* 2; *u'* 4-5.

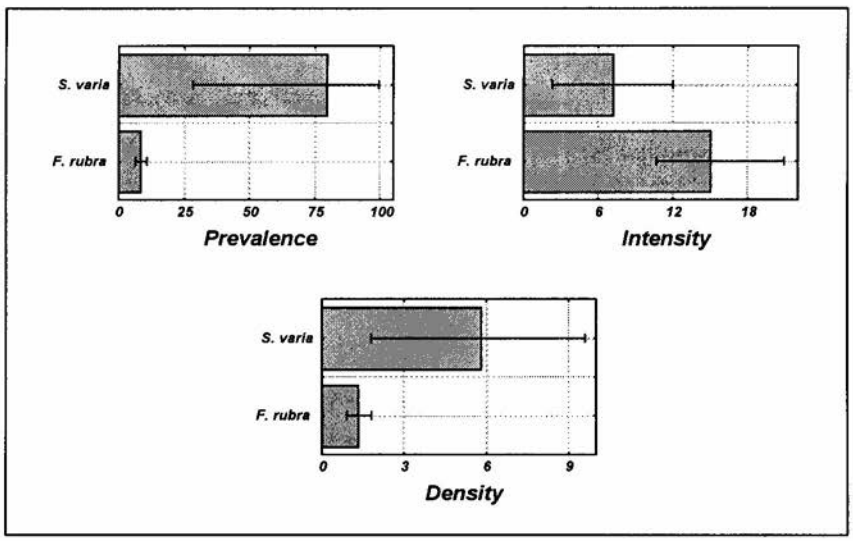
Genital parts 14-17 long, 17-20 wide, surface below the eugenital setae with lines (Fig. 103).

Length of setae: pedipalpal: *d* 12-13; *ep* 3; coxal: *1b* 9-10; *1a* 24; *2a* 45; opisthosomal: *c2* 37-43; *d* 52; *e* 41-52; *f* 22-26; *3a* 19-24; *h2* 64.

Distance between tubercles bearing setae: coxal: *1b* 12; *1a* 8-9; *2a* 20-23; *1b* and *1a* 10; *1a* and *2a* 7-9; opisthosomal: *c2* 38; *d* 27-29; *e* 19-23; *f* 15-16; *3a* 13-16; *h2* 9.

Number of ventral annuli bearing setae: *c2* 9; *d* 19; *e* 36; *f* 55-64, 6-7 from rear.

Nymph (n=3) (Fig. 104): Body spindleform. Body length 191-221, wide 50-60. Gnathosoma 24 long; chelicerae 26-27 long.




105. Prevalence, intensity and density of infestation of *Jaranasia sesleriae* on *Sesleria varia* and *Festuca rubra*

Prodorsal shield: 38-40 long, 38-40 wide. Triangularly-oval, with little anterior lobe over cheliceral base. Sculpture: similar to that of female. Tubercles of setae *sc* and setae *sc* absent.

Coxae: with a pattern of dashes and conical microtubercles. Sternal line absent.

Opisthosoma with 60-62 dorsal annuli, 61-64 ventral annuli, 8 coxigenital annuli. Annuli with microtubercles similar to that of female.

Leg I: 31-33; femur 9-10, seta *bv* 9-10; genu 5-6, seta *l"* 25-27; tibia 7-8, seta *l'* 7; tarsus 7, setae: *ft"* 23-24; *ft'* 19-21, *u'* 5; solenidion $\omega$ 8; empodium 8, simple, 6-rayed, symmetrical. Position of setae: *bv* 5; *l"* 3-4; *l'* 4; *ft"* and *ft'* 2; *u'* 5-6.

Leg II: 26-30; femur 9, *bv* 8-11; genu 6, *l"* 10-11; tibia 5-6; tarsus 6-7, *ft"* 21, *ft'* 8, *u'* 4; solenidion $\omega$ 7; empodium 7-8, 6-rayed, symmetrical. Position of setae: *bv* 4; *l"* 4; *ft"* and *ft'* 2; *u'* 4.

Length of setae: pedipalpal: *d* 9-11; *v* 2; *ep* 3 coxal: *1b* 8; *1a* 14; *2a* 35; opisthosomal: *c2* 24-28; *d* 25-29; *e* 19-28; *f* 20; *3a* 8-9.

Distance between tubercles bearing setae: coxal: *1b* 13; *1a* 8; *2a* 23-25; *1b* and *1a* 10; *1a* and *2a* 8; opisthosomal: *c2* 34; *d* 24-27; *e* 15-16; *f* 17-18; *3a* 7-8; *h2* 8.

Number of ventral annuli bearing setae: *c2* 9; *d* 22-23; *e* 36-37; *f* 56-59, 6 from rear.

Larva not found

HOST PLANT

*Sesleria varia* (JACQ.) WETTST. Relation to host plant: refugee-seeking: in furrows on upper leaf surfaces, no visible damages.

TYPE MATERIAL

Female holotype, 51 female paratypes, 10 male paratypes, 10 nymph paratypes.

Type locality: Pieniny Mts., Wąwóz Homole gorge, ravine, calcareous rock [PWH], 24.08.1999, leg. AS.

ETYMOLOGY

The specific designation is derived from the generic name of type host plant – *Sesleria.*

Table 14

Parameters of infestation of *Jaranasia sesleriae*. For legend see Table 2.

| Host species | *n* | *k* | *P* | *LCI* | *UCI* | *I* | *LCI* | *UCI* | *D* | *LCI* | *UCI* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. *Festuca rubra*** | 682 | 58 | 8.5 | 6.5 | 10.9 | 15.0 | 10.7 | 20.9 | 1.3 | 0.9 | 1.8 |
| 2. *Sesleria varia** | 5 | 4 | 80.0 | 28.4 | 99.5 | 7.3 | 2.3 | 12.0 | 5.8 | 1.8 | 9.6 |

OTHER RECORDS

*Festuca rubra*: [PLM2] - 28.11.1999, (111); 23.09.1999, (214); 30.07.1999, (47); 31.08.1999, (93); [PLM3] - 30.07.1999, (18); 23.10.1999, (180); 23.10.1999, (61); 29.02.2000, (38).

ECOLOGICAL NOTES

Specialist II, found on two host species. One of which: *Sesleria varia* is a specific host, whereas *Festuca rubra* is an accessory host (Table 14; Fig. 105).

## Family: Phytoptidae MURRAY, 1887
## Subfamily: Novophytoptinae ROIVAINEN, 1953
## *Novophytoptus* ROIVAINEN, 1947

### *Novophytoptus ammophillae* SKORACKA et BOCZEK, 2000

DESCRIPTION

Complete description in SKORACKA & BOCZEK (2000b).

Female (n=7) (Figs 106-108): Body vermiform, elongated. Body length 296-360; width 48-59. Gnathosoma 27-29 long; chelicerae 20-25 long.

Prodorsal shield: 41-46 long, 38-41 wide. Elongate-trapezoid, without anterior lobe. Sculpture: median and admedian joined, forming one, stout line; few short lines near central line; subrounded, concentrated microtubercles above tubercles of *sc* setae. Tubercles of *sc* setae on rear margin of shield, 17-20 apart. Setae *sc* 83-97 long, projecting to rear. Setae *ve* 11-15 long, 9-12 apart. Distance between *sc* and *ve* setae 19-22.

Coxae: long, longitudinal lines. Sternal line distinct, forming reversed T.

Opisthosoma with 87-89 dorsal annuli, 77-79 ventral annuli, 12-15 coxigenital annuli. Dorsal and ventral annuli with elongated microtubercles ahead of annuli margins, on dorsal telosomal annuli microtubercles absent.

Leg I: 33-38; femur 10-13, seta *bv* absent; genu 5-7, seta *l''* 10-14; tibia 8-10, seta *l'* 5-7; tarsus 5-6; solenidion $\omega$ 5-6, knobbed; empodium 6-9, simple, 4-rayed, symmetrical.

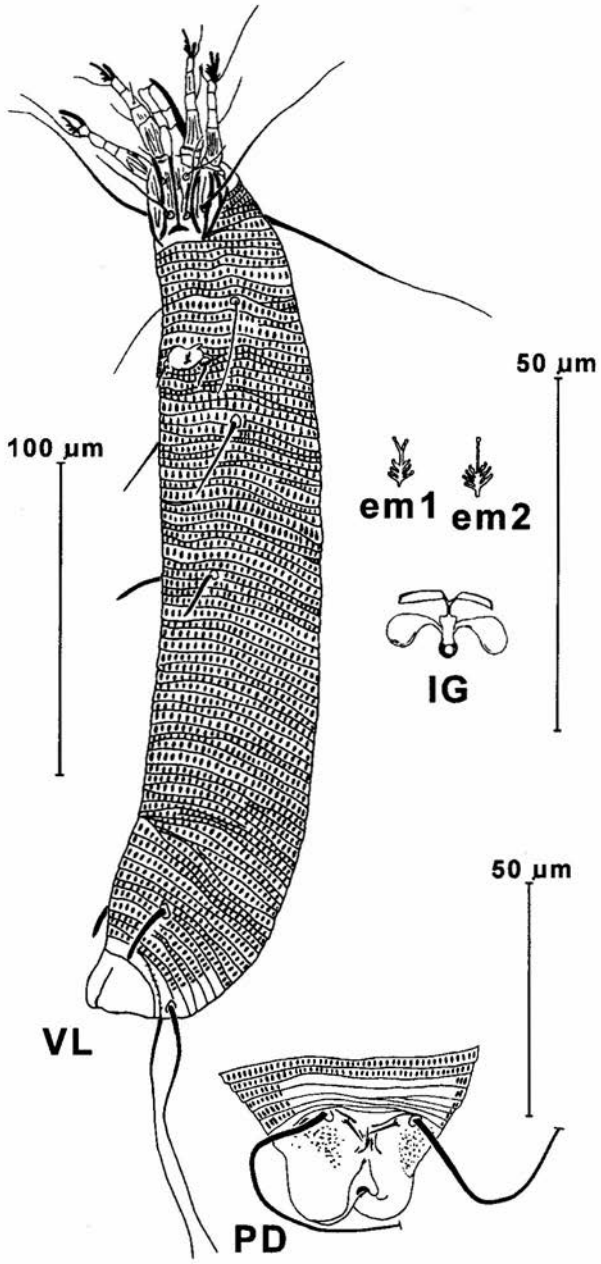
Leg II: 30-36; femur 12-15, seta *bv* absent; genu 5-6, *l''* 14-17; tibia 6-8; tarsus 5-6; solenidion $\omega$ 9-10, knobbed; empodium 8-9, 4-rayed, asymmetrical.

Genital parts 7-10 long, 12-15 wide, genital coverflap smooth.

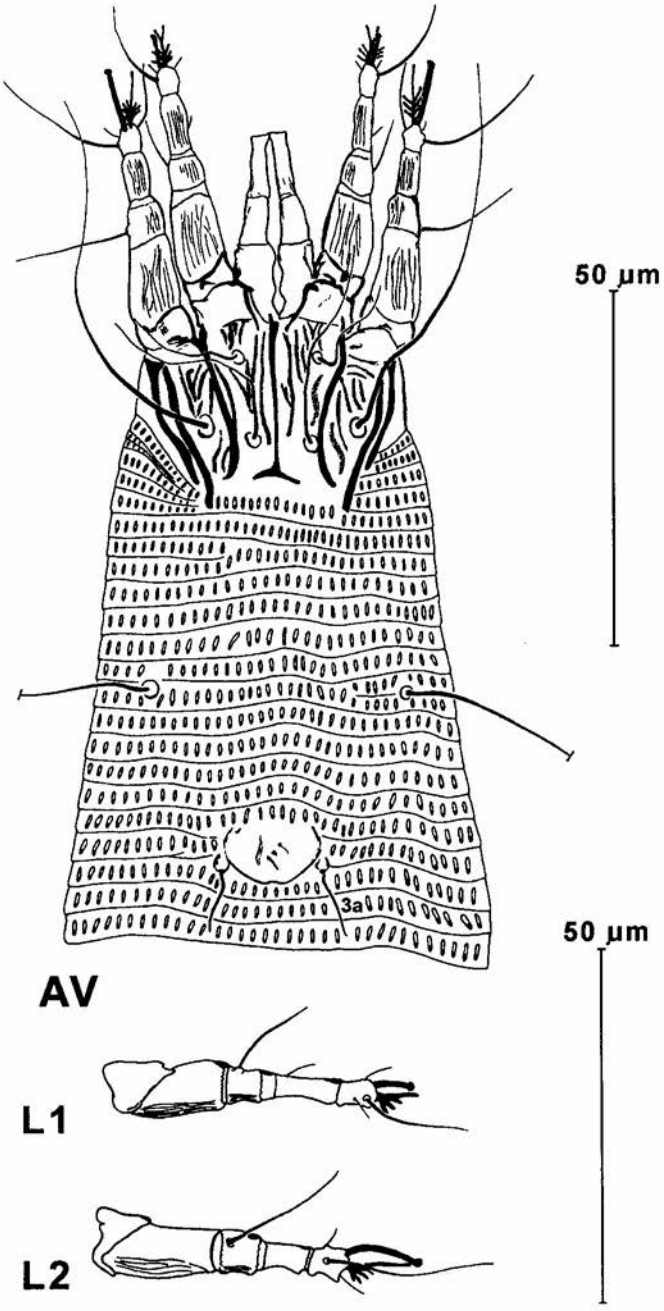
Length of setae: coxal: *1b* 10-16; *1a* 24-29; *2a* 48-55; opisthosomal: *c2* 23-29; *d* 24-26; *e* 12-16; *f* 18-20; *h1* 6-7; *h2* 76-85; *3a* 10-13. Setae *f* stout.

Distance between tubercles bearing coxal setae: *1b* 10-12; *1a* 5-9; *2a* 17-23; *1b* and *1a* 11-12; *1a* and *2a* 6-9.

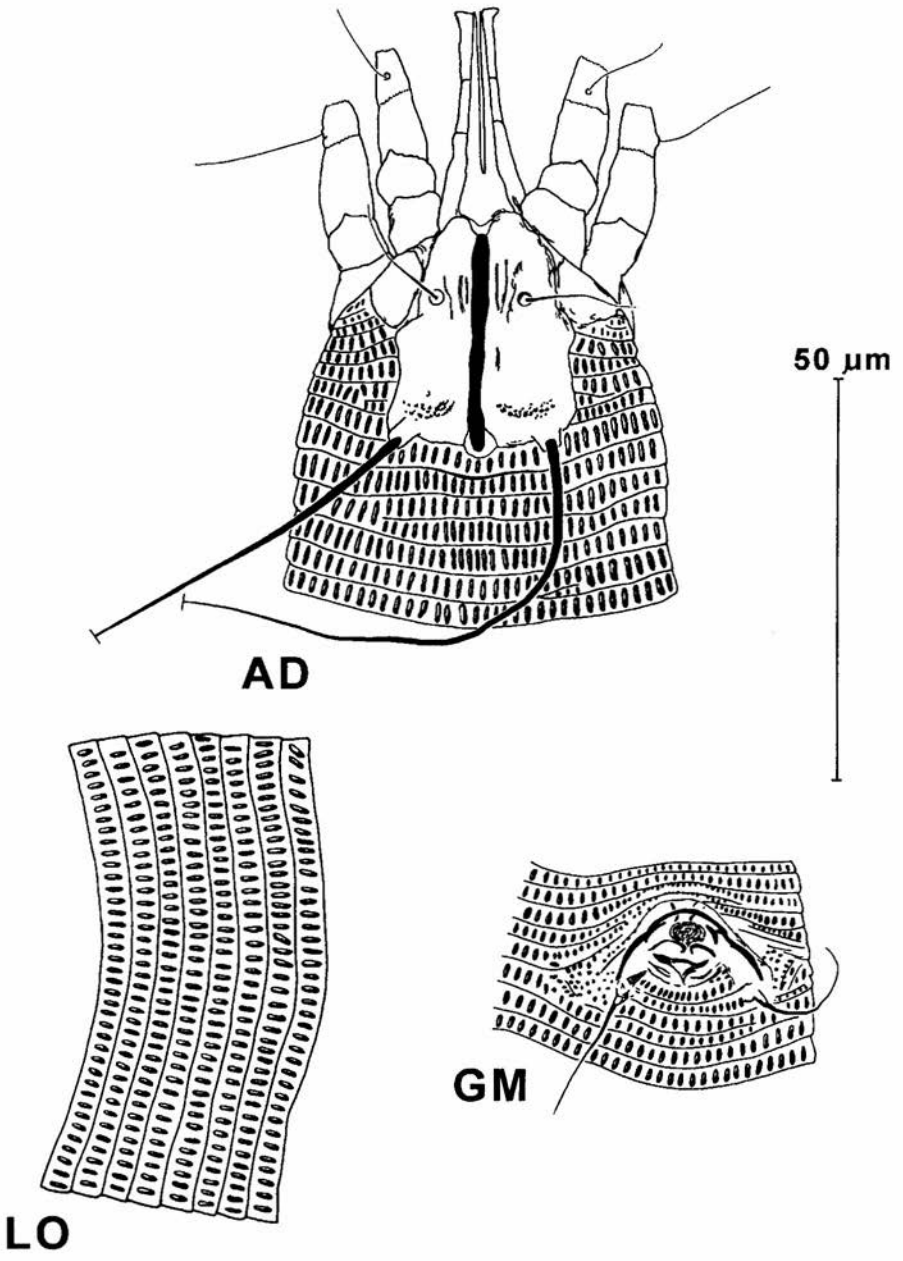
Male (n=3): Body vermifrom, elongated. Body length 290-311; width 58. Gnathosoma 48 long; chelicerae 46-48 long.




106. *Novophytoptus ammophillae* Skoracka et Boczek, female: IG – internal genitalia, PD – dorsal telosome, VL – latero-ventral aspect, em1 – empodium of leg I, em2 – empodium of leg II




107. *Novophytoptus ammophillae* Skoracka et Boczek, female: AV – antero-ventral aspect, L1, L2 – legs I and II




108. *Novophytoptus ammophillae* SKORACKA et BOCZEK: AD – antero-dorsal aspect of female, GM – genital region of male, LO – lateral opisthosoma of female

Prodorsal shield: 30-35 long, 27 wide. Shape and sculpture similar to that of female. Setae *sc* 54-57 long, 23-25 apart, projecting to rear. Setae *ve* 11-14 long, 14-15 apart. Distance between setae *sc* and *ve* 18-19.

Coxae: with a pattern similar to that of female.

Opisthosoma with 86-90 dorsal annuli, 83-84 ventral annuli, 12 coxigenital annuli. Annuli with microtubercles similar to that of female.

Leg I: 41; femur 12-14, seta *bv* absent; genu 6, seta *l''* 16; tibia 12-13, seta *l'* 5; tarsus 6-7; solenidion $\omega$ 8, knobbed; empodium 5, simple, 4-rayed, symmetrical.

Leg II: 36-38; femur 14, seta *bv* absent; genu 5-6, *l''* 18-19; tibia 9-10; tarsus 6; solenidion $\omega$ 10; empodium 5, 4-rayed, asymmetrical.

Genital parts 10-11 long, 17-19 wide (Fig. 108).

Length of setae: coxal *1b* 14; *1a* 21-24; *2a* 38-40; opisthosomal: *c2* 21-25; *d* 24-29; *e* 14-21; *f* 18-19; *h1* 6; *3a* 19.

Nymph, larva not found

HOST PLANT

*Ammophila arenaria* (L.) LINK.

Relation to host plant: vagrant on the upper leaf surface, no visible damages.

MATERIAL

37 females, 10 males from Międzyzdroje, littoral dune [ME1], 21.07.1999, leg. AS.

ECOLOGICAL NOTES

Specialists I on *A. arenaria*. The values of infestation ($n$=5; $k$=3): $P$=60.0% (*Cl*: 14.7%-94.7%); $I$=15.7 (*Cl*: 2.7-34.3) specimens per shoot; $D$=9.4 (*Cl*: 1.6-20.6) specimens per shoot.

GENERAL DISTRIBUTION

Palearctic Region. The species so far was recorded in Poland (SKORACKA & BOCZEK 2000b).

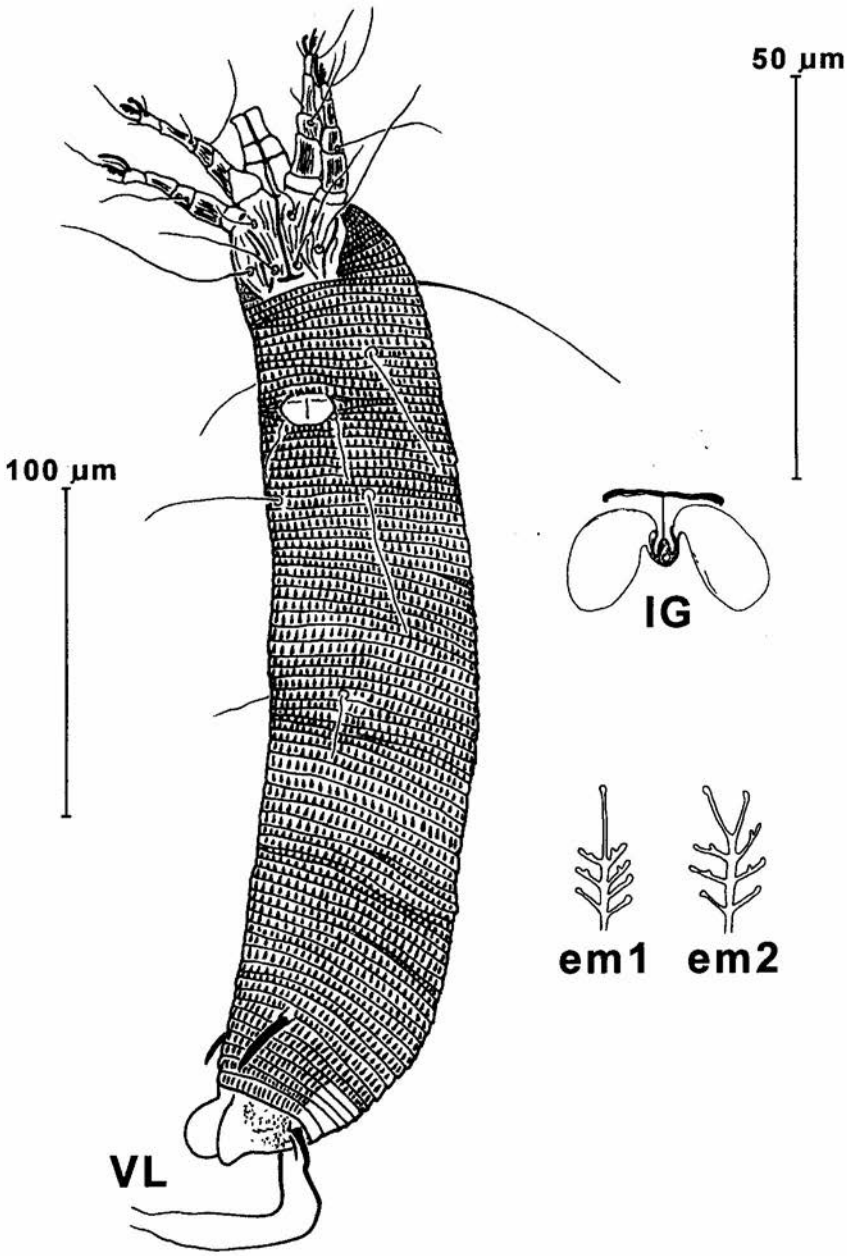
### *Novophytoptus glyceriae* SKORACKA et BOCZEK, 2000

DESCRIPTION

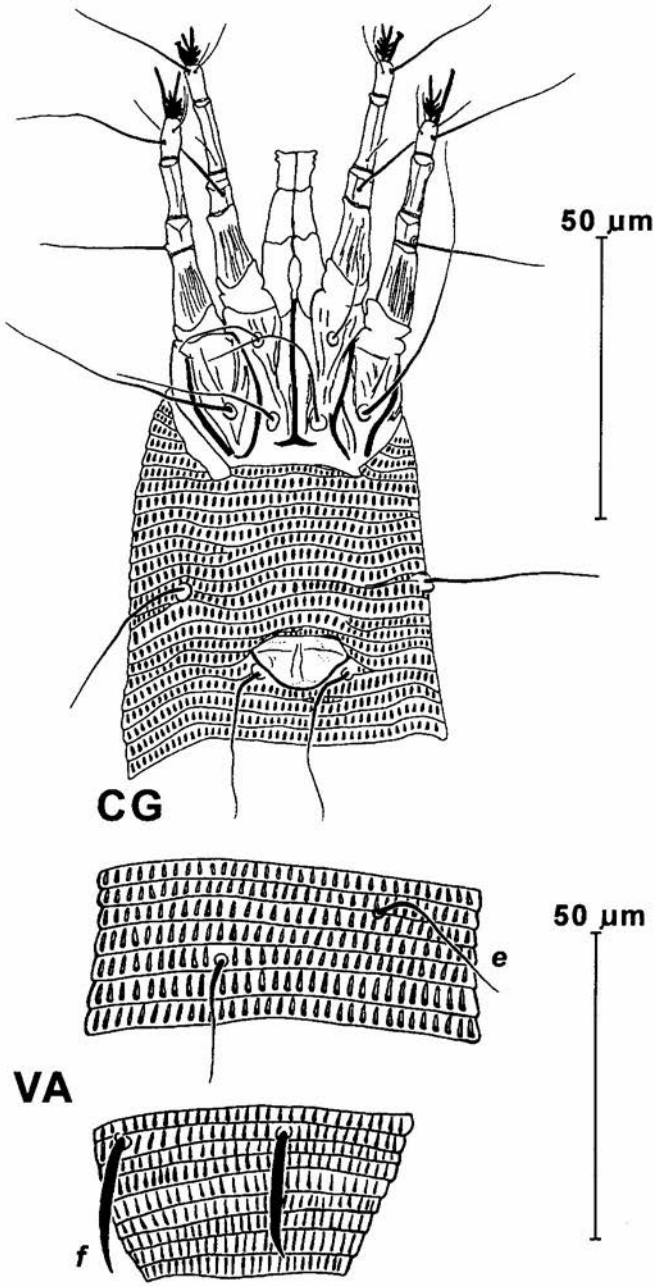
Complete description in SKORACKA & BOCZEK (2000b)

Female (n=12) (Figs 109-111): Body vermiform, elongated. Body length 294-365; width 51-61. Gnathosoma 26-29 long; chelicerae 27-30 long.

Prodorsal shield: 34-39 long, 30-38 wide. Triangularly-trapezoid. Sculpture: median and admedian lines stout, on rear half single, on posterior half joined and forming singular stout line; I submedian lines short and wavy, near tubercles of *ve*




109. *Novophytoptus glyceriae* SKORACKA et BOCZEK, female: IG– internal genitalia, VL – latero-ventral aspect, em1 – empodium of leg I, em2 – empodium of leg II



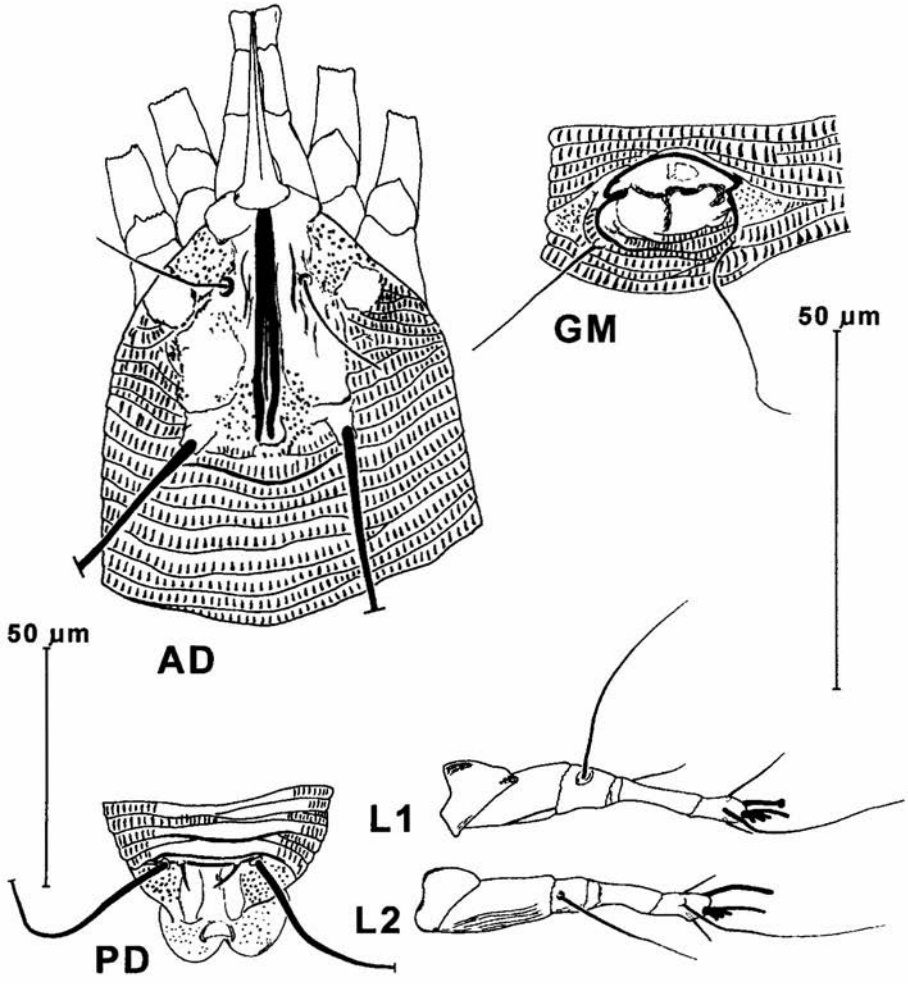

110. *Novophytoptus glyceriae* Skoracka et Boczek, female: CG – coxigenital region, VA – ventral annuli, *e* – 2nd ventral seta, *f* – 3rd ventral seta

setae. Tubercles of *sc* setae on rear margin, 21-27 apart. Setae *sc* 78-97 long, projecting to rear. Setae *ve* 15-20 long, 10-12 apart. Distance between *sc* and *ve* setae 21-25.

Coxae: long, longitudinal lines. Sternal line distinct, forming reversed T.

Opisthosoma with 84-99 dorsal annuli, 77-93 ventral annuli. Dorsal and ventral annuli with elongated microtubercles ahead of annuli margins, on dorsal telosomal annuli microtubercles absent.

Leg I: 42-47; femur 13-15, seta *bv* absent; genu 7-8, seta *l''* 24-37; tibia 13-15, seta *l'* 7-9; tarsus 6-7; solenidion $\omega$ 6-7, knobbed; empodium 7-8, simple, 4-rayed, symmetrical.




111. *Novophytoptus glyceriae* SKORACKA et BOCZEK: AD – antero-dorsal aspect of female, GM – genital region of male, L1, L2 – legs I and II of female, PD – dorsal telosoma of female

Leg II: 41-44; femur 13-15, seta *bv* absent; genu 6-7, *l''* 23-33; tibia 10-13; tarsus 7-9; solenidion *ω* 10-11; empodium 9-10, 4-rayed, asymmetrical.

Genital parts 10-13 long, 16-18 wide, genital coverflap smooth.

Length of setae: coxal: *1b* 15-19; *1a* 30-44; *2a* 43-64; opisthosomal: *c2* 32-40; *d* 37-67; *e* 19-22; *f* 21-23; *h1* 5-7; *h2* 75-114; *3a* 19-26. Setae *f* stout.

Distance between tubercles bearing coxal setae: *1b* 13-15; *1a* 8-10; *2a* 23-27; *1b* and *1a* 12-17; *1a* and *2a* 8-10.

Male (n=1): Body vermifrom, elongated. Body length 316; width 67. Gnathosoma 31 long. Prodorsal shield: 38 long. Shape and sculpture similar to that of female. Setae *sc* 29 apart. Setae *ve* 19 long, 16 apart.

Coxae: with a pattern similar to that of female.

Opisthosoma with 97 dorsal annuli, 84 ventral annuli, 13 coxigenital annuli. Annuli with microtubercles similar to that of female.

Leg I: 43; femur 14, seta *bv* absent; genu 7, seta *l''* 32; tibia 12, seta *l'* 12; tarsus 6; solenidion *ω* 6, knobbed; empodium 6, simple, 4-rayed, symmetrical.

Leg II: 39; femur 13, seta *bv* absent; genu 6, *l''* 25; tibia 10; tarsus 6; solenidion *ω* 10; empodium 5, 4-rayed, asymmetrical.

Genital parts 11 long, 20 wide (Fig. 111)

Length of setae: coxal *1b* 29; *1a* 28; *2a* 55; opisthosomal: *c2* 40; *d* 49; *e* 16; *f* 19; *h1* 6; *h2* 79; *3a* 29.

Distance between tubercles bearing coxal setae: *1b* 15; *1a* 9; *2a* 27; *1b* and *1a* 13; *1a* and *2a* 10.

Nymph, larva not found

HOST PLANT

*Glyceria maxima* (HARTMAN) HOLMB. Relation to host plant: vagrant on the upper leaf surface; no visible damages.

MATERIAL

39 females, 6 males from Słupia Wielka near Środa Wlkp. COBORU, side of rearing pond [SWC4], 27.07.1999, leg. AS.

Other records: *G. maxima*: [SWC4] - 24.06.1999, (15); 27.07.1999, (24).

ECOLOGICAL NOTES

Specialist I on *G. maxima*. The values of infestation ($n$=50; $k$=2): $P$=20.0% (*Cl*: 10.0%-33.7%); $I$=11.1 (*Cl*: 5.1-24.8) specimens per shoot; $D$=2.2 (*Cl*: 1.0-5.0) specimens per shoot.

GENERAL DISTRIBUTION

Palearctic Region. The species so far was recorded in Poland (SKORACKA & BOCZEK 2000b).

5.2 KEY TO FEMALES

1. Prodorsal shield with one to five setae, always with anterior setae present. Legs without *bv* setae. Tibia I with apico-ventral solenidion.
..... Phytoptidae
- Prodorsal shield with maximally two setae, anterior setae absent. Legs with *bv* setae; never with tibial solenidion.
..... Eriophyidae

**Phytoptidae MURRAY, 1887**

1. Median and admedian lines completely joined, forming singular, stout line; tibia I 8-10 long, tibia II 6-8 long; setae *3a* 10-12 long.
..... *Novophytoptus ammophillae* SKORACKA et BOCZEK
- Median and admedian lines joined only in its posterior half; tibia I 13-15 long, tibia II 10-13 long; setae *3a* 22-26 long.
..... *Novophytoptus glyceriae* SKORACKA et BOCZEK

**Eriophyidae NALEPA, 1898**

1. Body vermiform; prodorsal shield typically lacking a frontal lobe or with only slight projection over cheliceral base.
..... Eriophyinae
-. Body fusiform; prodorsal shield with a broad-based and rigid frontal lobe over gnathosoma.
..... Phyllocoptinae

**Eriophyinae NALEPA, 1898**

1. Opisthosoma with broad longitudinal dorsal furrow; prodorsal shield with sinuous margins.
..... *Acaralox arundinaceus* SKORACKA
-. Opisthosoma without longitudinal dorsal furrow; margins of prodorsal shield not sinuous.
..... 2 (*Aceria* KEIFER)
2. Setae *h1* absent; coxigenital region with a pattern of rounded microtubercles and holes.
..... *A. absentia* n. sp.
-. Setae *h1* present; coxigenital region with a pattern of lines or microtubercles
..... 3.
3. Median line on prodorsal shield present.
..... 4.
-. Median line on prodorsal shield absent.
..... 12.

4. Median line on at least 3/4 rear half of prodorsal shield. ..... 5.
-. Median line on 1/2 rear half of prodorsal shield or shorter. ..... 6.
5. Solenidia knobbed; lateral part of prodorsal shield with dashes; gnathosoma 30 long; prodorsal shield wider than long. ..... *A. taurica* MITROFANOV et SHARONOV
-. Solenidia without knobs; dashes only on rear half of prodorsal shield; gnathosoma 22 long; prodorsal shield longer than wide. ..... *A. calamagrostis* SUKHAREVA
6. Sculpture of prodorsal shield present on rear half of shield. ..... 7.
- Entire surface of prodorsal shield with sculpture. ..... 8.
7. Median line split with admedian lines forming "M"; anterior lobe of prodorsal shield pointed with a little thorn; setae *sc* not longer than 34; number of dorsal annuli less than 64. ..... *A. stipaespinulata* n. sp.
-. Median line not split and not connected with admedian lines; anterior lobe of prodorsal shield rounded; setae *sc* longer than 48; number of dorsal annuli more than 69. ..... *A. flexuosae* n. sp.
8. Dorsal microtubercles conical and pointed. ..... 9.
-. Dorsal microtubercles rounded, if conical then blunted. ..... 10.
9. Sternal line slender; setae *sc* shorter than 49; setae *c2* shorter than 37. ..... *A. erecti* n. sp.
-. Sternal line stout; setae *sc* longer than 69; setae *c2* longer than 45. ..... *A. tosichella* KEIFER
10. Empodium 5-rayed. ..... *A. tenuis* (NALEPA)
-. Empodium 6-9-rayed. ..... 11.
11. Prodorsal shield wider than long; I submedian lines from anterior lobe running to tubercles bearing setae *sc*; transversal, arched lines present between I and II submedian lines, and II submedian lines and lateral margins of shield ..... *A. glomerivagrans* n. sp.
-. Prodorsal shield as wide as long or slightly longer than wide; I submedian lines present on central part of shield, straight, parallel to admedian; transversal, arched lines on prodorsal shield absent. ..... *A. aculiformia* SUKHAREVA

12. I and II submedian lines forming rhomb-like figures over tubercles bearing setae *sc*; dorsal annuli with conical microtubercles; ventral annuli with rounded microtubercles; empodium 6-7-rayed.
..... *A. eximia* SUKHAREVA
-. I submedian lines absent; II submedian lines parallel to lateral margins of shield; short transversal line present over tubercles bearing *sc* setae; dorsal annuli smooth; ventral annuli with pointed microtubercles; empodium: 8-9-rayed.
..... *A. nardusi* n. sp.

**Phyllocoptinae NALEPA, 1892**

1. Setae *sc* and *h1* absent.
..... *Jaranasia sesleriae* n. sp.
-. Setae *sc* and *h1* present.
..... 2.
2. Opisthosoma with dorsal ridges.
..... 3 (*Abacarus*).
-. Opisthosoma without dorsal ridges.
..... 7 (*Aculodes*).
3. Anterior lobe of prodorsal shield pointed.
..... 4.
-. Anterior lobe of prodorsal shield rounded.
..... 5.
4. Opisthosomal dorsal ridge short, reaching 14-15 annuli; dorsal microtubercles large, irregularly situated; solenidia knobbed.
..... *A. tucholensis* SKORACKA
-. Opisthosomal dorsal ridge long reaching telosoma; dorsal microtubercles absent, solenidia unknobbed.
..... *A. compactus* SUKHAREVA
5. Median line present, anteriorly splited.
..... *A. acutatus* SUKHAREVA
-. Median line absent.
..... 6.
6. Amedian lines present on rear half of shield; II submedian line fragmented; setae *sc* shorter than 14.
..... *A. longilobus* SKORACKA
-. Admedian and II submedian lines entire; setae *sc* longer than 28.
..... *A. hystrix* (NALEPA)
7. Median line of prodorsal shield absent.
..... 8.
-. Median line of prodorsal shield present.
..... 9.

8. Empodium 7-8-rayed; setae *sc* shorter than 46.
..... *A. capillarisi* SKORACKA
-. Empodium 9-rayed; setae *sc* longer than 63.
..... *A. dubius* (NALEPA)
9. Median line fragmented, at least one of its fragment anteriorly split.
..... *A. deschampsiae* (SUKHAREVA)
-. Median line continuous, not fragmented.
..... 10.
10. Dorsal microtubercles pointed.
..... 11.
-. Dorsal microtubercles subrounded.
..... 12.
11. I submedian lines short, present only on median part of shield; sculpture of prodorsal shield with numerous triangular cavities; setae *sc* and *c2* shorter than 35; opisthosomal setae *d* shorter than 50.
..... *A. multitricavus* n. sp.
-. I submedian lines running from anterior lobe to tubercles bearing *sc* setae and then diverging to lateral margins of shield; triangular cavities on prodorsal shield absent; setae *sc* and *c2* longer than 46; opisthosomal setae *d* longer than 61.
..... *A. mckenziei* (KEIFER)
12. I submedian lines absent; dorsal microtubercles regularly situated; setae *sc* shorter than 29.
..... *A. calamaabditus* SKORACKA
-. I submedian lines present; dorsal microtubercles irregularly situated; setae *sc* longer than 58.
..... *A. holcusi* n. sp.

### 5.3. HOST SPECIFICITY

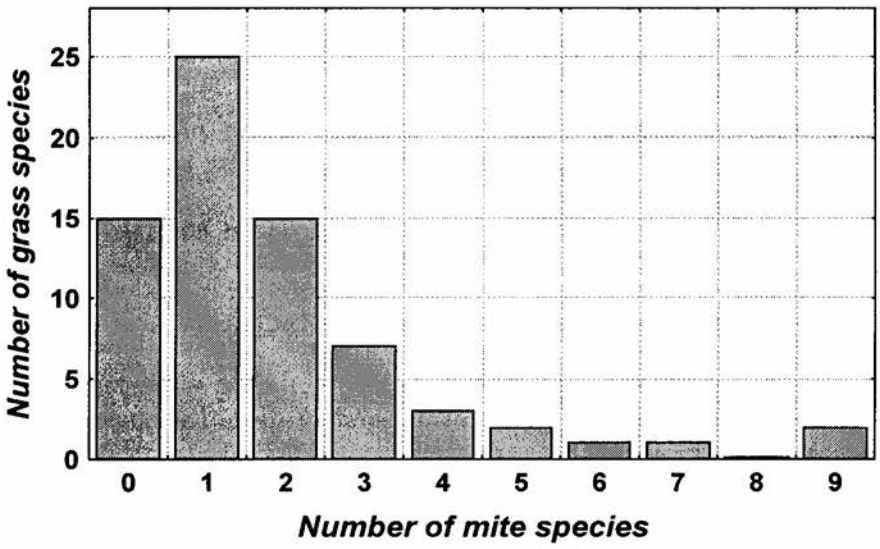
Among all collected grass species eriophyoid mites were not found on 15 of them. The greatest number of grass species (i.e. 25) were recorded as hosts for only one mite species. Two mite species were found on 15 grass species, three mite species on only seven grass species. Larger number of eriophyoid species were found on only few grass species (Fig. 112).

Most of eriophyoid mite species (i.e. 11) inhabiting grasses showed very narrow specificity, and were restricted to one host plant species. Four eriophyoid species showed also narrow specificity but inhabited two or three host species. Four mite species had wide specificity and were recognized as generalists (Fig. 113).

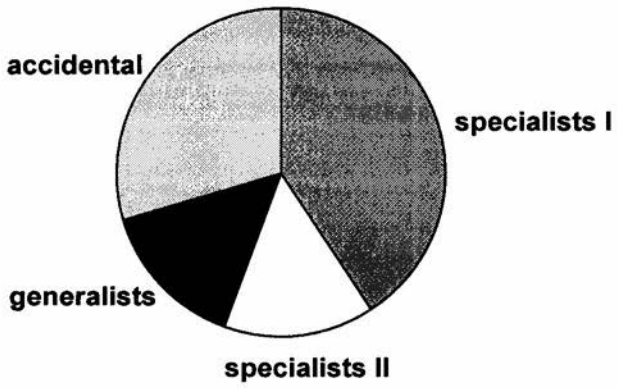
The following mite species belong to respective class of mite specificity:

1) specialists I: *Aceria erecti*, *A. eximia*, *A. flexuosae*, *A. glomerivagrans*, *A. nardusi*, *Acaralox arundinaceus*, *Abacarus tucholensis*, *Aculodes deschampsiae*, *A. holcusi*, *Novophytoptus ammophillae, N. glyceriae.*

2) specialists II: *Aceria aculiformia*, *A. stipaespinulata*, *Abacarus acutatus* and *Jaranasia seslariae.*




112. Number of eriophyoid mite species found on respective number of grass species

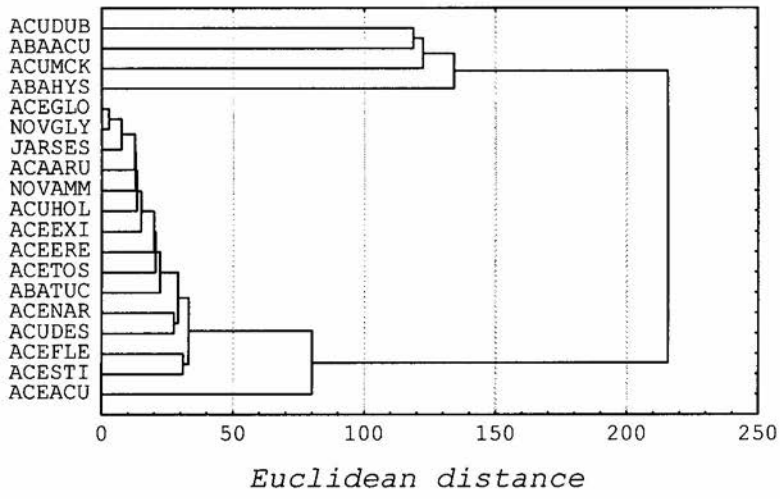



113. Proportion of eriophyoid mite species in various classes of mite specificity

3) generalists: *Aceria tosichella*, *Abacarus hystrix*, *Aculodes dubius* and *A. mckenziei*.

Because of very low value of density ($D<1$) attained on each of the infested host species, eight eriophyoid species were recognized as accidental. There were *Aceria absentia*, *A. anthocoptes*, *A. calamagrostis*, *A. taurica*, *Abacarus longilobus*, *Aculodes calamaabditus*, *A. capillarisi*, *A. multitricavus*. Although some of them may be accidental on grasses generally (i.e. *A. anthocoptes*), others may be accidental only on studied species of grasses. A detailed description of this problem is a subject of a separate paper (SKORACKA & KUCZYŃSKI in prep.).

The dendrogram on Fig. 114 illustrates the relationships between eriophyoid mites species according to their infestation similarity. Mite species are grouped into two large clusters; the first contains almost all generalists (except one species) and the second contains almost all specialists I and II (except one species). *Abacarus acutatus* recognized as specialist II was located together with three generalists in the first group. *Aceria tosichella* recognized as generalist was located together with specialists I and II in the second group. The reasons of such aggregation are probably the values of mite density, which are higher for generalists (except *A. tosichella*) and lower for specialists I and II (except *A. acutatus*).




114. Dendrogram showing eriophyoid mite species infestation similarity. Legend: ACUDUB – *Aculodes dubius*, ABAACU – *Abacarus acutatus*, ACUMCK – *Aculodes mckenziei*, ABAHYS – *Abacarus hystrix*, ACEGLO – *Aceria glomerivagrans*, NOVGLY – *Novophytoptus glyceriae*, JARSES – *Jaranasia seslariae*, ACAARU – *Acaralox arundinaceus*, NOVAMM – *Novophytoptus ammophillae* , ACUHOL – *Aculodes holcusi*, ACEEXI – *Aceria eximia*, ACEERE – *Aceria erecti*, ACETOS – *Aceria tosichella*, ABATUC – *Abacarus tucholensis*, ACENAR – *Aceria nardusi*, ACUDES – *Aculodes deschampsiae*, ACEFLE – *Aceria flexuosae*, ACESTI – *Aceria stipaespinulata*, ACEACU – *Aceria aculiformia*

## 6. CONCLUSIONS

1. The grass-infesting Eriophyoidea are represented in Poland by six genera and 29 species.

2. The number of grass species recorded in Poland is about 200 (FALKOWSKI 1982), of which 56 are found as infested by eriophyoid mites. Because during the survey conducted in Poland up to date, only about 40% of grass species were concerned in eriophyoid mite survey, it is expected that grass-infesting eriophyoid fauna in Poland is much more rich.

3. Many descriptions of eriophyoid species are not thoroughly done. The immatures and males of many species have not been morphologically studied (NUZZACI & DE LILLO 1996) and the significance of their morphological traits in systematics has not been examined up to date. Wishing to reduce this gap, descriptions of grass-inhabiting eriophyoid species found during this study were supplemented and completed. Males, nymphs and larvae of *Aceria aculiformia*, *A. eximia*, *A. tosichella*, *Abacarus acutatus*, *A. hystrix*, *Aculodes dubius*, *A. mckenziei* were described for the first time.

4. The most often and abundant eriophyoid species on grasses in Poland were: *Abacarus hystrix*, *Aculodes mckenziei* and *A. dubius*. These results correspond with studies conducted in Poland by KOZŁOWSKI (2001) in the Wielkopolska region, as well as with observations carried out in other countries (PAINTER & SCHESSER 1954; SLYKHUIS 1955, 1961, 1969; ORLOB 1966; NAULT & STYER 1969; PROESELER 1972; GIBSON 1974; GIBSON & PLUMB 1976; SMILANICK & ZALOM 1983; GUY & GOULD 1996).

5. Most of eriophyoid species are specialists and exhibit the limited host range (LINDQUIST & OLDFIELD 1996; OLDFIELD 1996; BOCZEK 1999). According to CROMROY (1979) more than 95% of species inhabit plant species of one plant genus, and among them 40% of species live on one host species. Studies conducted in Poland showed that grass-inhabiting eriophyoid species may have host specificity varying from narrow to extremely wide. However, the greatest number of them (about 60%) are specialists limited to one host species. Less in number (about 20%) are either specialists II which live on two or three species and generalists which have broad host range. Less narrow host ranges among species living on herbaceous plants (like grasses) may be interpreted in the way that these hosts provide a less stable habitat (GUTIERREZ & HELLE 1985). Although the problem of host specificity in Eriophyoidea is recently discussed, evolutionary trends in their host plant ranges are still difficult to interpret (LINDQUIST & OLDFIELD 1996; OLDFIELD 1996). However, the progress in genetic methods (i.e. directly analysing mite DNA) will probably allow an understanding of mite-host plant interactions (FENTON 2000 et al.; KUMAR et al. 2001).

6. Occurrence of mite species on some plants do not prove that this plant species is a suitable host for mites. The analysis of infestation parameters showed that many plant species may be accidental hosts for eriophyoid mites. For example, the number of hosts recorded for generalists: *Abacarus hystrix*, *Aculodes*

*dubius*, *A. mckenziei* and *Aceria tosichella* was respectively 37, 20, 14 and 13. However, taking into consideration the values of mite infestation, the number of suitable hosts was smaller, i.e. 30, 12, 8 and 7, respectively. The occurrence on an accidental host is very possible in eriophyoid mites because they disperse passively on air currents (NAULT & STYER 1969).

## 7. ACKNOWLEDGMENTS

I wish to thank Prof. J. BOCZEK (SGGW Warszawa), Prof. W. NIEDBAŁA and Prof. Cz. BŁASZAK (UAM Poznań) for their help and valuable advice during my work on Eriophyoidea, Dr. L. KUCZYŃSKI (UAM, Poznań) for his valuable support, assistance and statistical help, Dr. W. MAGOWSKI and Dr. Z. OLSZANOWSKI (UAM, Poznań) for consultations and constructive suggestions. To all I am grateful for critical comments which greatly improved the manuscript. I am indebted to Prof. David ORWIN for correcting the English text. I thank authorities of the "Danko" Plant Breeding Centre in Choryń and Research Centre for Cultivar Testing in Słupia Wielka for permissions on collecting plant material, and also Dr. J. PRZYBYŁ (RCCT, Słupia Wielka), Dr. M. LEMBICZ, Prof. J. BŁOSZYK, Dr. A. SURMACKI, A. SZYWILEWSKA, H. FERENC, Prof. K. LATOWSKI (UAM, Poznań), T. RUTKOWSKI for help in collecting plant material. I am grateful to Prof. A. PACYNA (Jagiellonian University, Kraków), Prof. K. LATOWSKI, Dr. P. GÓRSKI (UAM, Poznań) and Dr. J. PRZYBYŁ (RCCT, Słupia Wielka) for help in determining grasses and helpful suggestions. I am also thankful to my colleagues from the Institute of Environmental Biology (UAM, Poznań) for many inspiring brainstorming sessions. The study was supported by the Polish Scientific Research Committee (research grant No. 6 P04 C0 5418). During the year 2003 the author was supported by The Foundation for Polish Science (FNP).

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## 9. INDEX OF LATIN NAMES OF MITES

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