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## New Eriophyoid mites (Acari Eriophyoidea) from Italy. II<sup>o</sup>

### ABSTRACT

Three new eriophyoid species, collected in Veneto (Northern Italy), are described and illustrated also using scanning electron microscopy. *Aceria biradiatus* n. sp. was found vagrant on *Corylus avellana* L. (Fam. Corylaceae). *Cecidophyes campestris* n. sp. was collected on *Acer campestre* L. and *A. pseudoplatanus* L. (Fam. Aceraceae); it was associated to a hypertrichosis on the leaves of *A. campestre* at the level of the nervature ramifications. *Diptacus corni* n. sp. was vagrant on *Cornus sanguinea* L. (Fam. Comeaceae).

Key words: hedges, phytophagous, alternative prey.

### INTRODUCTION

A research on the Arthropod fauna has been made in Veneto (Northern Italy) for well understanding the importance of hedge plants in the three-trophic-relationships (i. e. wild plants and cultivated plants - pests - natural enemies) in which they are involved. Many eriophyoids have been found and, in the present contribution, three new species are described.

### METHODS

Dried and living specimens were prepared using the usual methods applied for light microscopy (JEPPSON *et al.*, 1975) and scanning electron microscopy observations (NUZZACI & VOVLAS, 1976; NUZZACI *et al.*, 1991). Lindquist's terminology (1996) of the morphological details has been adopted. The measurements of mites were made according to Amrine and Manson (1996). The classification of the genus was made according to the key of Amrine (1996).

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Type materials are deposited at the Institute of Agricultural Entomology, Faculty of Agriculture, University of Bari, Italy.

#### DRAWING ABBREVIATIONS

AP1, internal female genitalia; CS, lateral view of a caudal region; DA, dorsal view of the prodorsal shield; E, empodium; ES, lateral view of tergite-steronites or annuli; GF, coxal and genital region of a female; L, lateral view; LI, foreleg; SA, lateral view of anterior region.

#### ***Aceria biradiatus*** n. sp.

FEMALE (Figs 1-2) - Body cylindrical, colour yellowish, 175 (155-195 range of 8 specimens)  $\mu\text{m}$  long, 48 (42-51)  $\mu\text{m}$  wide and 48 (43-55)  $\mu\text{m}$  thick. Gnathosoma 18 (16-20)  $\mu\text{m}$  long projecting obliquely downwards, chelicerae 16 (15-18)  $\mu\text{m}$  long, seta d 4  $\mu\text{m}$  long. Prodorsal shield 33 (30-37)  $\mu\text{m}$  long, 30 (27-31)  $\mu\text{m}$  wide, subtriangular in anterior shape with an anteriomedian lobe over gnathosoma base; shield pattern composed of lines, with a median on the rear 1/3, an admedian, two submedian lines on each side; a transverse arcuate line crosses the inner submedian and connects this with the admedian line. Sc tubercles are set very close to the rear shield margin 14 (13-17)  $\mu\text{m}$  apart with sc setae 47 (35-52)  $\mu\text{m}$  long, directed to the rear.

Foreleg 33 (31-35)  $\mu\text{m}$  long, tibia 6  $\mu\text{m}$  long, tarsus 8  $\mu\text{m}$  long, w 9  $\mu\text{m}$  long, unknobbed, empodium 6  $\mu\text{m}$  long, 2-rayed. Hindleg 29 (25-33)  $\mu\text{m}$  long, tibia 5  $\mu\text{m}$  long, tarsus 8  $\mu\text{m}$  long, solenidium 9  $\mu\text{m}$  long unknobbed, empodium 5  $\mu\text{m}$  long, 2-rayed. Coxae smooth; 1b setae 10 (8-12)  $\mu\text{m}$  long, 1b tubercles 9  $\mu\text{m}$  apart, 1a setae 27 (20-32)  $\mu\text{m}$  long, 1a tubercles 7  $\mu\text{m}$  apart, 2a setae 41 (35-50)  $\mu\text{m}$  long, 2a tubercles 20  $\mu\text{m}$  apart. Prosternal apodeme 6  $\mu\text{m}$  long. Opisthosoma with 69 (55-75) annuli. Microtubercles on the rear margins of annuli, slightly pointed over margins.

c2 setae 14 (12-15)  $\mu\text{m}$  long on annulus 9 (7-10), d setae 36 (30-45)  $\mu\text{m}$  long on annulus 23 (21-25); e setae 13 (10-15)  $\mu\text{m}$  long on annulus 39 (24-45); f setae 26 (25-33)  $\mu\text{m}$  long on annulus 64 (51-71). Last 4 annuli with elongated and linear tubercles. h2 setae 75 (62-90)  $\mu\text{m}$  long, h1 setae 4  $\mu\text{m}$  long.

Genitalia 12  $\mu\text{m}$  long, 19  $\mu\text{m}$  wide. Female genital coverflap with 6 longitudinal striae; 3a setae 15 (13-16)  $\mu\text{m}$  apart, 12 (12-13)  $\mu\text{m}$  long.

MALE - 160 (155-200)  $\mu\text{m}$  long, 51  $\mu\text{m}$  wide, prodorsal shield 32  $\mu\text{m}$  long; sc tubercles 20  $\mu\text{m}$  apart, sc setae 34  $\mu\text{m}$  long; opisthosoma with about 59 (52-64) annuli. Genitalia 17  $\mu\text{m}$  wide.

*Host plant* - *Corylus avellana* L. (Fam. Corylaceae).

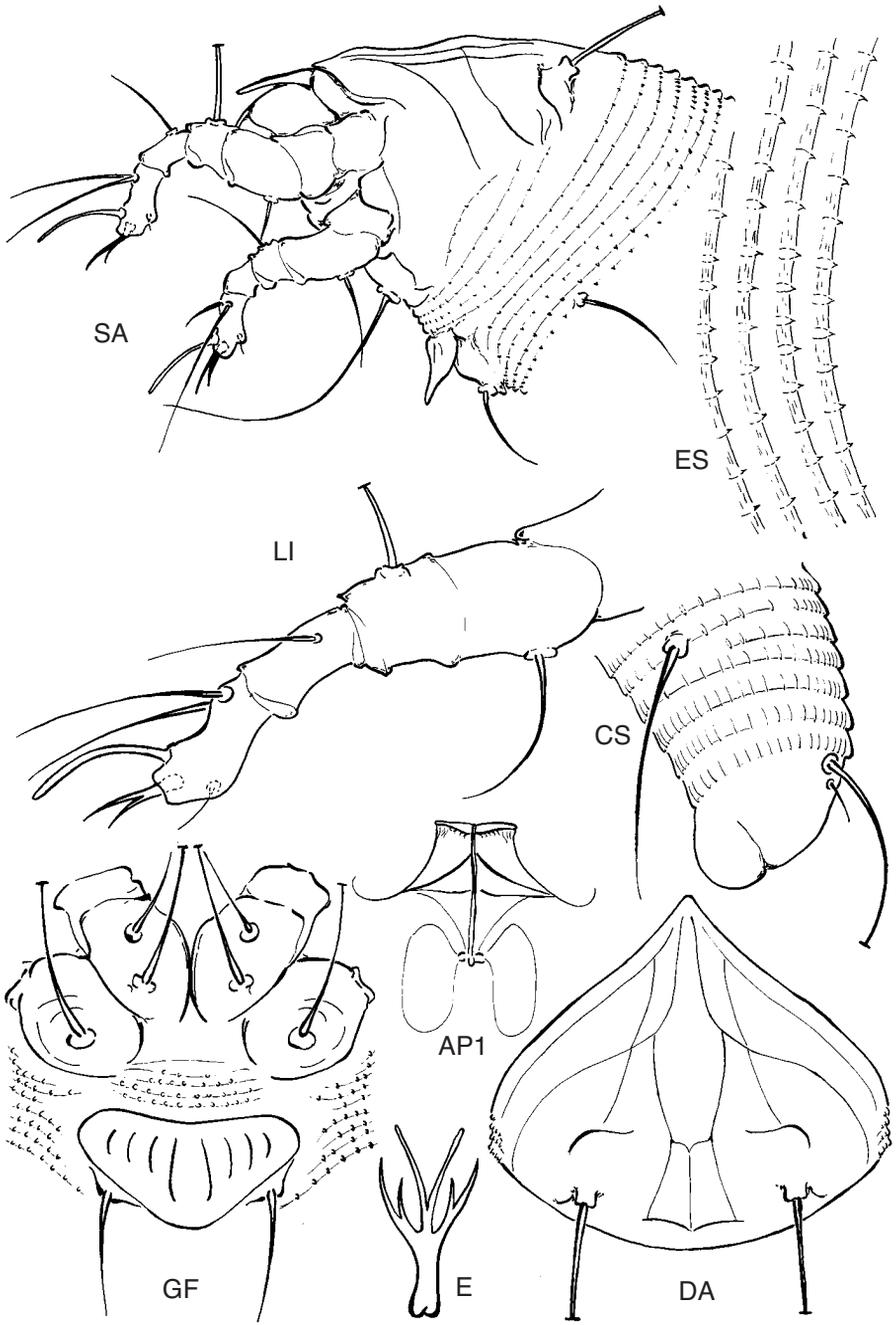


Fig. 1 - Semischematic drawings of *Aceria biradiatus*.

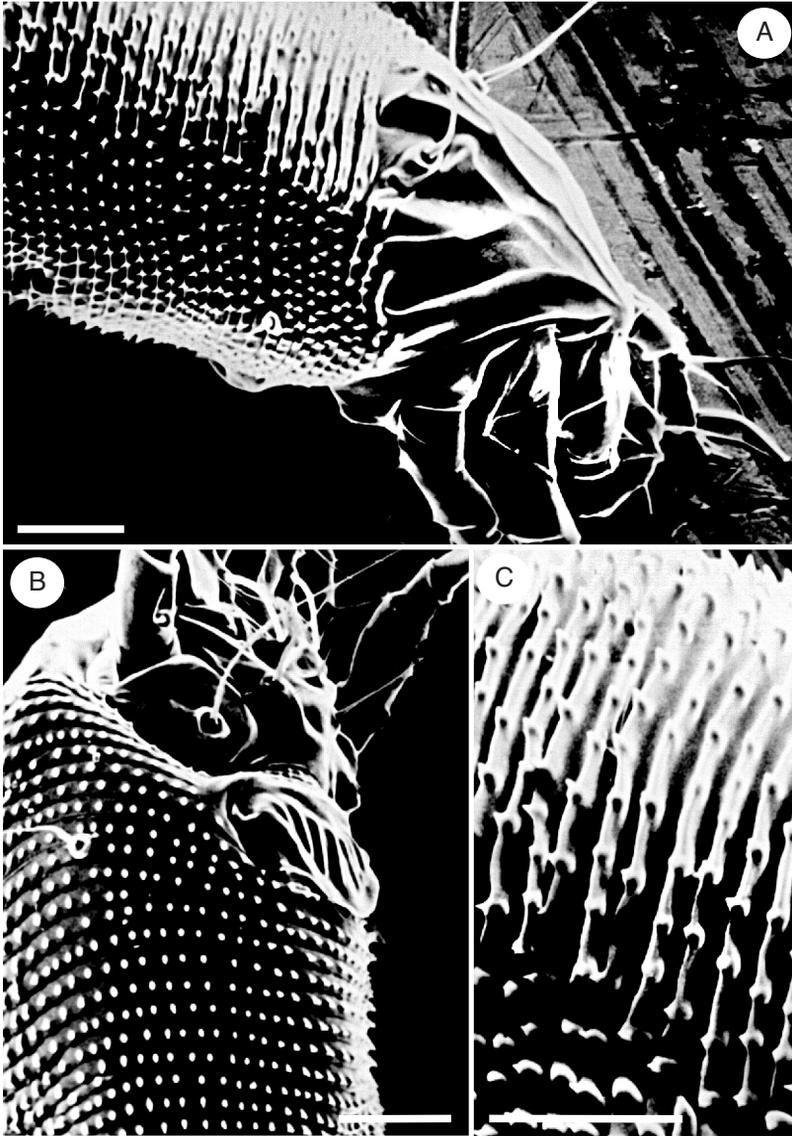


Fig. 2 - Scanning electron micrographs of *Aceria biradiatus*: A) lateral view of the pro-dorsal shield and gnathosoma; B) subventral view of the coxal and genital region of a female; C) detail of the microtubercles. Scale bars = 10  $\mu\text{m}$ .

*Type locality* - Montecchio (Prov. Vicenza), Italy.

*Type materials* - Holotype: 4 females and 4 males on slide, dated 5 July, 1995; Paratypes: slides from samples collected in Montecchio at different dates.

*Collected by* - Fontana P., Drago A.

*Other material* - Envelopes of dry leaves and mummified mites from which the above slides were made.

*Relation to the host* - Mites vagrants on leaves. No injuries were observed.

*Remarks* - No *Aceria* sp. has been described on *C. avellana* until now. *A. biradiatus* appears to be very close to *Aceria macrotrichus* (Nalepa) found on *Carpinus* but differs for its shield design.

***Cecidophyes campestris* n. sp.**

FEMALE (Figs 3-4) - Body robust, fusiform, colour yellowish, 195 (165-250 range of 10 specimens)  $\mu\text{m}$  long, 53 (49-56)  $\mu\text{m}$  wide and 58 (50-60)  $\mu\text{m}$  thick. Gnathosoma 32 (30-35)  $\mu\text{m}$  long projecting obliquely downwards, chelicerae 26 (25-28)  $\mu\text{m}$  long, seta d 5  $\mu\text{m}$  long. Prodorsal shield 36 (32-40)  $\mu\text{m}$  long, 43 (35-48)  $\mu\text{m}$  wide, semicircular in anterior shape with an anteriomedian lobe over gnathosoma base 8  $\mu\text{m}$  long, broad and blunt; shield pattern composed of a solid design of lines, with a complete median and admedian lines; this latter is connected to the median line by three V-shaped lines at different levels; admedian and submedian lines form closed and opened cells. Sc tubercles and setae absent.

Foreleg 33 (32-36)  $\mu\text{m}$  long, tibia 8  $\mu\text{m}$  long, tarsus 8  $\mu\text{m}$  long, w 8  $\mu\text{m}$  long, unknobbed, empodium 6  $\mu\text{m}$  long, simple 6-rayed. Hindleg 30 (30-32)  $\mu\text{m}$  long, tibia 6  $\mu\text{m}$  long, tarsus 8  $\mu\text{m}$  long, w 9  $\mu\text{m}$  long unknobbed, empodium 6  $\mu\text{m}$  long, simple 6-rayed. Coxae with outlined raised areas around the tubercles; 1b seta 8 (7-9)  $\mu\text{m}$  long, 1b tubercles 12  $\mu\text{m}$  apart, 1a seta 26 (22-30)  $\mu\text{m}$  long, 1a tubercles 12  $\mu\text{m}$  apart, 2a seta 41 (39-47)  $\mu\text{m}$  long, 2a tubercles 23  $\mu\text{m}$  apart. Prosternal apodeme 3  $\mu\text{m}$  long.

Opisthosoma with 47 (44-51) broad tergites and about 62 (59-65) narrow sternites. Microtubercles on the rear margins of tergites-sternites, bead-like and slightly pointed over margins.

c2 seta 30 (28-33)  $\mu\text{m}$  long on sternite 7 (6-8), d seta 60 (40-70)  $\mu\text{m}$  long on sternite 19 (18-21), e seta 12 (10-15)  $\mu\text{m}$  long on sternite 34 (32-36); f seta 28 (27-30)  $\mu\text{m}$  long on sternite 58 (55-61). Last 8 annuli with elongated and linear tubercles. h2 seta 58 (50-75)  $\mu\text{m}$  long, h1 seta absent.

Genitalia 13 (10-15)  $\mu\text{m}$  long, 22 (20-25)  $\mu\text{m}$  wide, appressed to coxae.

Female genital coverflap with about 12 longitudinal striae irregularly arranged in two ranks; 3a setae 18 (15-21)  $\mu\text{m}$  apart, 13 (12-16)  $\mu\text{m}$  long.

MALE - 165 (150-175 range of 6 specimens)  $\mu\text{m}$  long, 48  $\mu\text{m}$  wide, prodorsal shield 37  $\mu\text{m}$  long; opisthosoma with about 40 tergites and about 51 sternites. Genitalia 19  $\mu\text{m}$  wide.

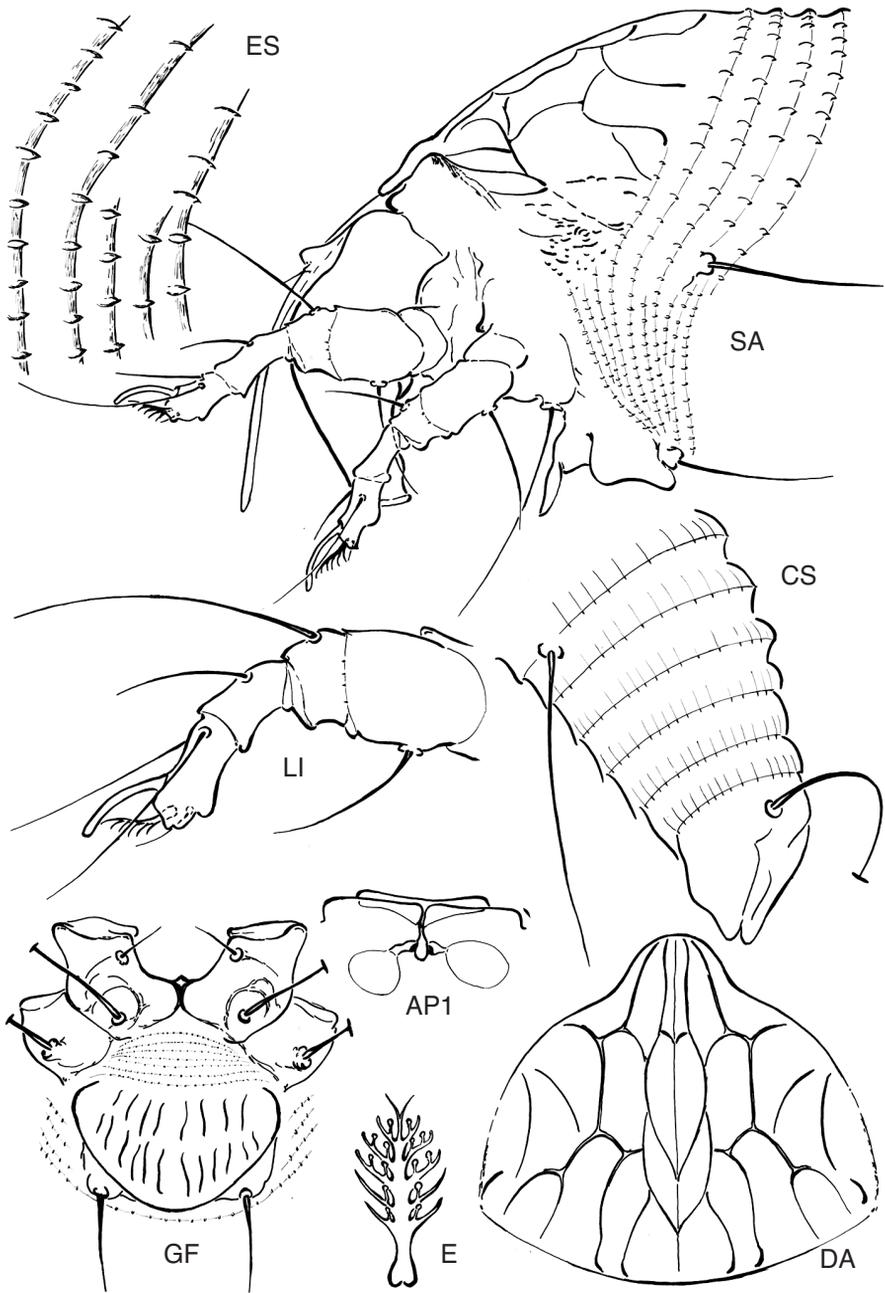


Fig. 3 - Semischematic drawings of *Cecidomyes campestris*.

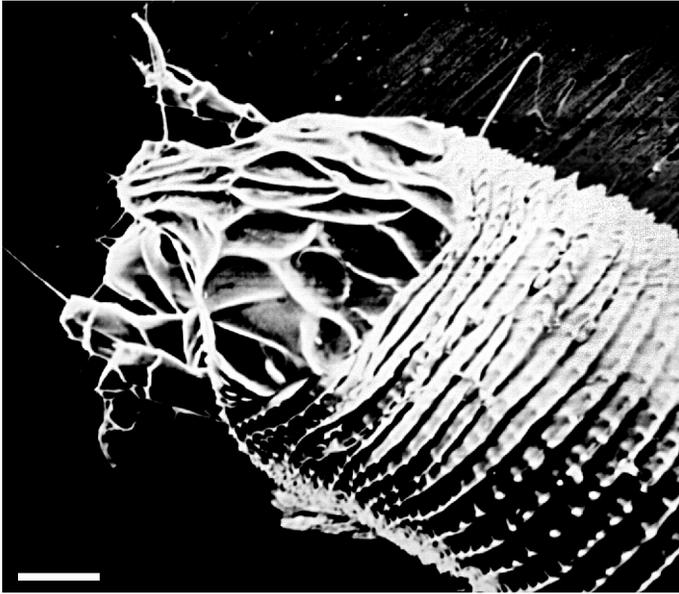


Fig. 4 - Scanning electron micrographs of *Cecidophyes campestris*: subdorsal view of the prodorsal shield. Scale bar = 10  $\mu$ m.

*Host plant* - *Acer campestre* L. (Fam. Aceraceae).

*Type locality* - Maser (Prov. Treviso), Italy.

*Type material* - Holotype 6 females and 2 males on a slide, dated 22, August 1995; Paratypes: many slides from the same and other localities and different dates.

*Collected by* - Fontana P., Drago A.

*Other host* - *Acer pseudoplatanus* L.

*Other localities* - Colli Euganei (Prov. Padova), Maser (Prov. Treviso), S. Martino di Lupari (Prov. Padova), S. Pietro di Barbozza (Prov. Treviso), Valdobbiadene (Prov. Treviso).

*Other material* - Envelopes of dry stems and leaves and mummified mites from which the above slides were made.

*Relation to the host* - The mites were found vagrants on leaf undersides, especially near the nervatures. They were often associated to a hypertrichosys of the nervature at the level of their ramifications.

*Remarks* - No *Cecidophyes* sp. has been found on *A. campestre* or *A. pseudoplatanus* until now, while *C. collegiatus* Keifer and *C. naulti* Styer were collected on other *Acer* spp. *C. campestris* differs from *C. arbuti* (Keifer) mainly for the prodorsal shield pattern, number of rays on the empodium,

proportion in the length of seta e and d. *C. campestris* is very close to *C. caryvagrans* Keifer and differs a bit for the shield design.

***Diptacus corni*** n. sp.

PROTOGYNE (Figs 5-6) - Body robust spindleform, colour yellowish, 240 (185-290, range of 10 specimens)  $\mu\text{m}$  long, 100 (90-105)  $\mu\text{m}$  wide and 96 (90-107)  $\mu\text{m}$  thick. Gnathosoma 53 (48-59)  $\mu\text{m}$  long projecting obliquely downwards, chelicerae 60 (50-65)  $\mu\text{m}$  long, seta d 12 (10-14)  $\mu\text{m}$  long. Prodorsal shield 43 (39-49)  $\mu\text{m}$  long, 65 (58-70)  $\mu\text{m}$  wide, semicircular in anterior shape with a relatively short anteriormedian lobe over gnathosoma base which is broad and blunt; shield pattern composed of a network of lines, with a median line on the 1/3 anterior part, two admedian and four submedian lines; two transverse lines form two cells on median field and two cells for each side on the admedian and submedian field. Sc tubercles well ahead of the rear shield margin 26 (23-35)  $\mu\text{m}$  apart with sc setae 5  $\mu\text{m}$  long, directed to the up converging.

Foreleg 50 (45-56)  $\mu\text{m}$  long, tibia 15  $\mu\text{m}$  long, tarsus 10  $\mu\text{m}$  long, w 8  $\mu\text{m}$  long, with prominent knob, empodium divided, 6  $\mu\text{m}$  long, 6-rayed on each side. Hindleg 49 (44-51)  $\mu\text{m}$  long, tibia 12  $\mu\text{m}$  long, tarsus 10  $\mu\text{m}$  long, w 8  $\mu\text{m}$  long with prominent knob, empodium divided, 6  $\mu\text{m}$  long, 6-rayed on each side. Foreleg and hindleg without femoral seta.

Coxae with granules; 1b setae 12 (11-15)  $\mu\text{m}$  long, 1b tubercles 14  $\mu\text{m}$  apart, 1a setae 28 (20-37)  $\mu\text{m}$  long, 1a tubercles 13  $\mu\text{m}$  apart, 2a setae 55 (40-70)  $\mu\text{m}$  long, 2a tubercles 38  $\mu\text{m}$  apart. Prosternal apodeme 10  $\mu\text{m}$  long.

Opisthosoma with 57 (53-70) broad tergites forming a short central ridge, and about 98 (81-106) narrow sternites. Microtubercles on the rear margins of tergites and sternites, slightly pointed over margins; tergites with rare microtubercles and sternites with more appressed microtubercles.

c2 setae 55 (45-60)  $\mu\text{m}$  long on sternite 16 (15-20), d setae 70 (50-95)  $\mu\text{m}$  long very thin at the apex on sternite 36 (30-40); e setae 66 (52-80)  $\mu\text{m}$  long on sternite 58 (49-63); f setae 48 (40-53)  $\mu\text{m}$  long on sternite 87 (73-95). Last 9 annuli with elongated and linear tubercles. h2 setae 93 (64-135)  $\mu\text{m}$  long very thin at the apex, h1 setae very short  $\mu\text{m}$  long.

Genitalia 21  $\mu\text{m}$  long, 31  $\mu\text{m}$  wide. Female genital coverflap with irregular lines at the base; 3a setae 20 (18-25)  $\mu\text{m}$  apart, 9 (8-10)  $\mu\text{m}$  long.

DEUTOGYNE - This form differs from the protogyne mainly for the absence of microtubercles on the tergites and few microtubercles on the sternites.

MALE: 210 (190-255, range of 10 specimens)  $\mu\text{m}$  long, 78 (72-90)  $\mu\text{m}$  wide, prodorsal shield 40 (34-44)  $\mu\text{m}$  long; sc tubercles 25 (24-27)  $\mu\text{m}$  apart, sc

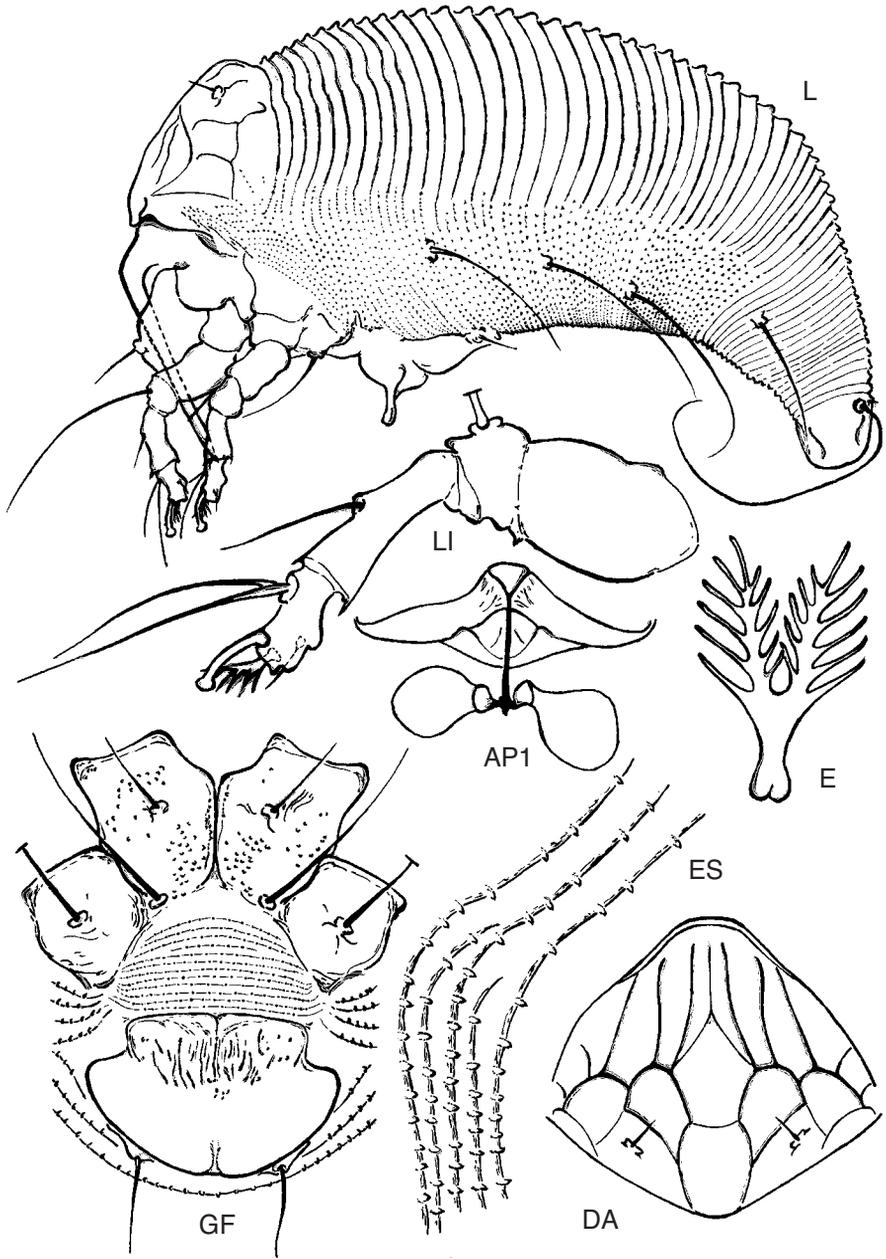


Fig. 5 - Semischematic drawings of *Diptacus corni*.

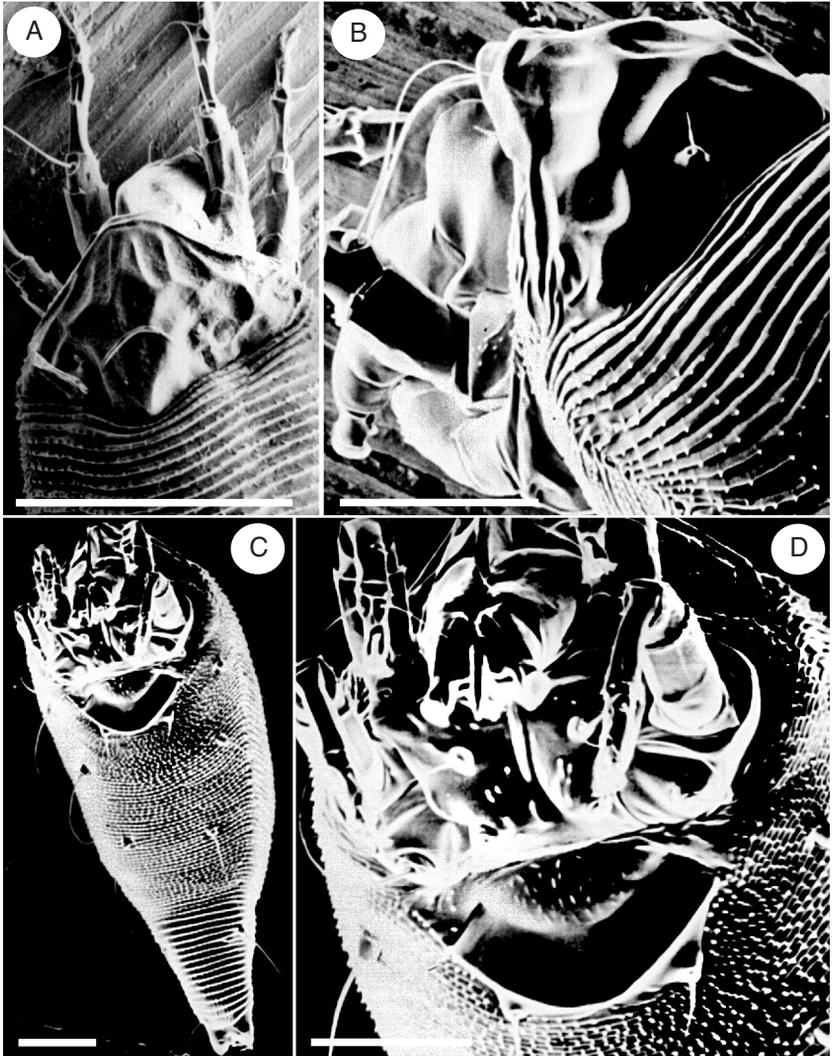


Fig. 6 - Scanning electron micrographs of *Diptacus corni*: A) dorsal view of the prodorsal shield; B) sublateral view of the prodorsal shield and gnathosoma; C) ventral view of a female; D) coxa-genital region and gnathosoma of a female. Scale bar = 20  $\mu\text{m}$ .

setae 4  $\mu\text{m}$  long; opisthosoma with 55 (49-58) tergites and about 83 (76-98) sternites. Genitalia 22 (17-27)  $\mu\text{m}$  wide, 19 (15-22)  $\mu\text{m}$  long.

*Host plant* - *Cornus sanguinea* L. (Fam. Cornaceae).

*Type locality* - Maser (Prov. Treviso), Italy.

*Type materials* - Holotype: 2 females on slide, dated 24, June 1994; Paratypes: many slides prepared from materials collected in Maser and other localities and different dates.

*Collected by* - Fontana P., Drago A.

*Other localities* - Montecchio (Prov. Vicenza), S. Pietro di Barbozza (Prov. Treviso), Villa di Teolo (Prov. Padova).

*Other materials* - Envelopes of dry stems and leaves and mummified mites from which the above slides were made.

*Relation to the host* - No particular damages were observed on the leaves. The mites were observed vagrants on the leaf undersides.

*Notes* - Four eriophyoid species have been described on *C. sanguinea* until now, but any of them belong to *Diptacus* (AMRINE & STASNY, 1994). *D. corni* is partially close to *D. pengsonae* Briones and McDaniel and *D. camarai* Carmona for the prodorsal shield network, but differs for other details.

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## RIASSUNTO

### ACARI ERIOFIOIDEI (ACARI ERIOPHYOIDEA) NUOVI PER L'ITALIA. II

Tre nuove specie di eriofioidei, raccolte in Veneto, sono descritte e illustrate anche mediante l'utilizzazione del microscopio elettronico a scansione. *Aceria biradiatus* sp. n. è stato raccolto vagante su foglie di *Corylus avellana* L. (Fam. Corylaceae). *Cecidophyes campestris* sp. n. è stato rinvenuto su *Acer campestre* L. e *A. pseudoplatanus* L. (Aceraceae); le foglie infestate di acero campestre presentavano una leggera ipertricosi presso la biforcazione delle nervature. *Diptacus corni* sp. n. è stato osservato vagante su *Cornus sanguinea* L. (Fam. Cornaceae).

Parole chiave: siepi, fitofagi, prede alternative.

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