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Two new *Vasates* species (Acari: Eriophyoidea) of *Euphorbia* L. from Yugoslavia with morphological notes on *Vasates euphorbiae* Petanović***

ABSTRACT

Vasates montenegrinus n. sp. and *V. glabriflorae* n. sp. (Acari: Eriophyoidea) are described and illustrated from *Euphorbia* spp. collected in Yugoslavia. They cause drying, shortening of plants and deformation of the inflorescences. Morphological notes and a more detailed illustration of *V. euphorbiae* Petanović have also been done. A key of *Vasates* species found on *Euphorbia* L. is given.

Key words: Eriophyid mites, leafy spurges, new species.

INTRODUCTION

A review of the literature revealed that, until now, 11 species of Eriophyids have been reported on leafy spurges (*Euphorbia* spp.) in Europe, North America and India: *Aceria dalmatina* (Nal.) on *Euphorbia characias* spp. *wulfenii* (Koch) A.R. Sm. in Yugoslavia Adriatic coast (NALEPA, 1914), *A. nanula* (Liro) on *E. esula* L. in Finland (LIRO, 1943), *Eriophyes euphorbiae* (Nal.) on *E. cyparissias* L. and *E. esula* in Austria and Yugoslavia (NALEPA, 1891; JANEŽIČ, 1974, 1982), *E. euphorbiae* Mohanasundaram on *E. antiquorum* L. in India (MOHANASUNDARAM, 1983), *E. hispidus* Cotte on *E. characias* (Hoppe) A.R., *E. nicaeensis* All., *E. segetalis* L. and *E. spinosa* L. in France (COTTE, 1916), and *E. septemlineatus* Petanović on *E. glareosa* ssp. *panonica* M.B. and *E. dendroides* L. in Yugoslavia (PETANOVIĆ, 1991), *Monochetus esulae* Liro on *E. esula* in Finland (LIRO, 1943), *Phyllocoptes euphorbiae* Farkas on *E. salicifolia* Host and *E. cyparissias* in Hungary and Poland (FARKAS, 1962; SZULC, 1966), *P. nevadensis* Roivainen on *E. luteola* Coss & D.R. and *E. esula* in Spain (ROIVAINEN, 1953), *Vasates euphorbicolus* K. on *E. corrolata* L. in U.S.A. (KEIFER, 1964), and *V. euphorbiae* Petanović on *E. seguierana* Neck., *E. cyparissias* and *E. glareosa* ssp. *panonica* (PETANOVIĆ, 1991).

The possibility of weed control by Eriophyids, pointed out by CROMROY

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(1979), CLEMENT *et al.* (1983), and BOCZEK (1992), has led to a study on leafy spurge Eriophyids in Yugoslavia. On the basis of these observations, two new species have been found on several *Euphorbia* species. They are described and illustrated by S.E.M. and light microscopy drawings. At the same time, morphological notes, more detailed drawings and S.E.M. illustrations of *Vasates euphorbiae* Petanović are reported.

A key of all *Vasates* species found on *Euphorbia* L. is also given.

MATERIAL AND METHODS

Infested parts of leafy spurges were collected in four years surveys conducted at more than 30 localities, in different habitats in Yugoslavia.

Eriophyids were mounted in Heinze or/and Keifer's media and studied under phase-contrast microscope.

Scanning electron micrographs were obtained according to NUZZACI and VOVLAS (1976) technique for live samples of *V. euphorbiae*. According to NUZZACI *et al.* (1991) procedures, dried and alcohol preserved Eriophyids have been put into the Keifer's medium I (Booster mixture), gently warmed, to bring the dead and deformed samples back to their original shape, then soaked in a KCl-glycerol solution, and observed. Micrographs were taken using a Stereoscan Cambridge S100 with the accelerating voltage set at 5 kilovolts, at the Institute of Agricultural Entomology, University of Bari, Italy.

The classification of the genus was made according to the key of BOCZEK *et al.* (1989).

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

DRAWING ABBREVIATIONS

- AP1, internal female genitalia
- CS, lateral view of caudal section
- DA, dorsal view of anterior section
- E, empodium
- ES, lateral view of tergite-sternite region
- GF, coxae and external female genitalia
- GM, external male genitalia
- L, foreleg
- SA, lateral view of anterior section

Vasates montenegrinus n. sp. (figs 1-2)

Female: 192 μm (176-220 μm) long, 85 μm (72-85 μm) wide and 73 μm thick, fusiform, colour yellowish. Gnathosoma 28 μm long projecting obliquely downwards, subapical seta 10 μm long, chelicerae 22 μm long. Dorsal shield 47 (45-50) μm long, 59 μm wide, semicircular, with an anterior lobe 15 μm long; shield pattern with one short median, one very long (almost complete) admedian and one short submedian line on each side. Dorsal tubercles on the rear shield margin 27 μm apart with dorsal setae 23 μm long, directed to the rear. Foreleg 40 μm long, tibia 11 μm long, tarsus 8 μm long, solenidium 8 μm long, unknobbed, empodium 7 μm long, 7-rayed. Hindleg 38 μm long, tibia 9 μm long, tarsus 7 μm long, solenidium 9 μm long unknobbed, empodium 7 μm long. Coxae with ornamentation of numerous granules. First forecoxal tubercles 12 μm apart, setae 13 μm long, second forecoxal tubercles 9 μm apart, setae 17 μm long; hindcoxal tubercles 25 μm apart, setae 27 μm long. Sternal line 8 μm long. Opisthosoma with 49 (48-53) microtuberculate tergites and about 71 (71-86) microtuberculate sternites. Microtubercles on rear margins. Lateral setae 36 μm long on sternite 14, 1st ventral setae 31 μm long on sternite 27; 2nd ventral setae 27 μm long on sternite 47; 3rd ventral setae 32 μm long on sternite 66. Last 5 rings with elongated tubercles. Caudal setae 50 μm long, accessory setae 5 μm long. Genitalia 14 μm long, 23 μm wide; coverflap with 10-12 striae; genital setae 15 μm apart, 14 μm long.

Male: 185 μm long, 75 μm wide, dorsal shield 45 μm long; dorsal tubercles 24 μm apart, dorsal setae 23 μm long; opisthosoma with about 45 tergites and about 65 sternites. Genitalia 18 μm wide.

Nymph II: 157 μm long; shield 39 μm long; dorsal tubercles 18 μm apart, dorsal setae 14 μm long; opisthosoma with about 60 rings; genital setae 9 μm apart, 9 μm long, on sternite 10.

Host plant: *Euphorbia myrsinites* L. (Euphorbiaceae).

Relation to the host: Mites live in shoot tips and in inflorescences causing drying, shortening of plants and deformation of the inflorescences.

Type material and locality: Holotype female on slide D 223/7, date 12.07.1991; type locality Ćurevac, c. 1600 m Mt. Durmitor, Montenegro, collected by R. Petanović. Paratypes 10, the same data as holotype.

This species is close to *V. euphorbiae* Petanović and can be distinguished by the pattern of the dorsal shield, the shape and the length of the dorsal shield lobe.

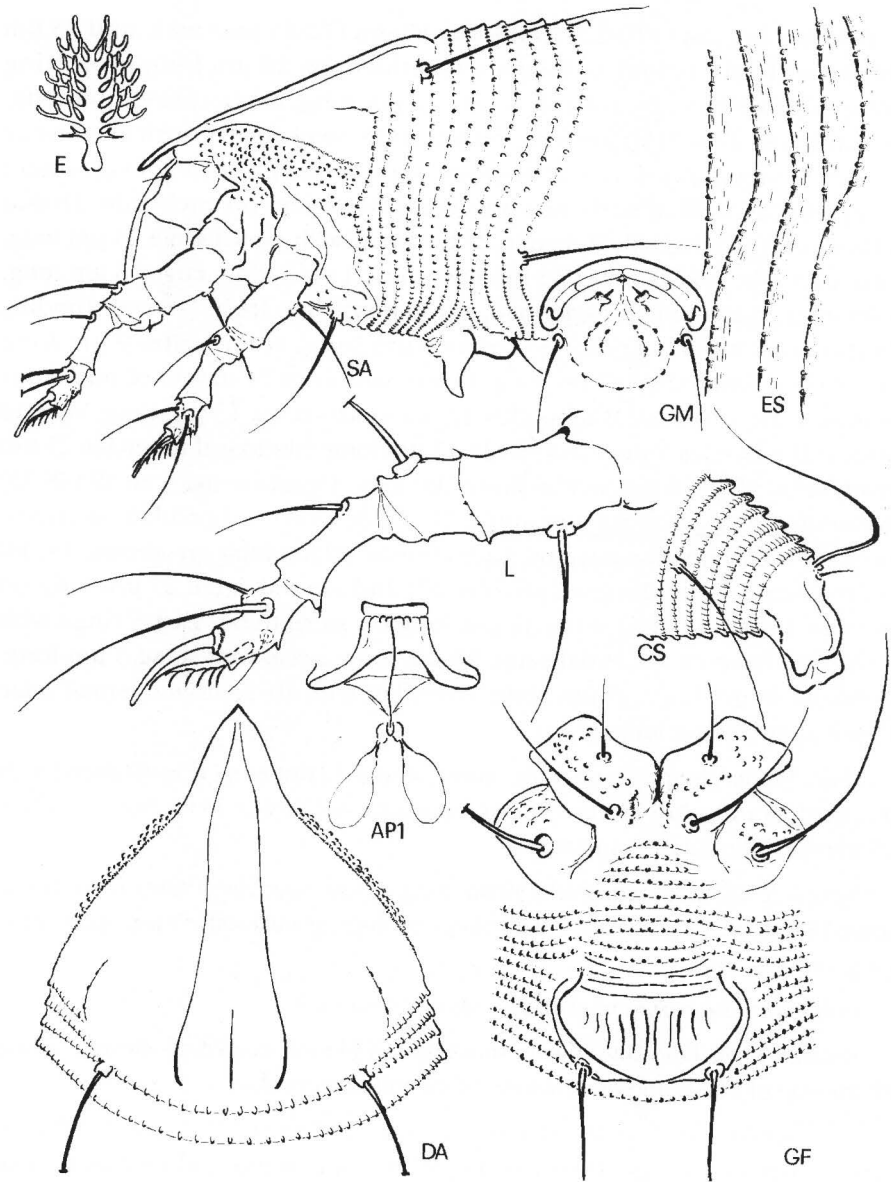


Fig. 1 - *Vasates montenegrinus* n. sp.

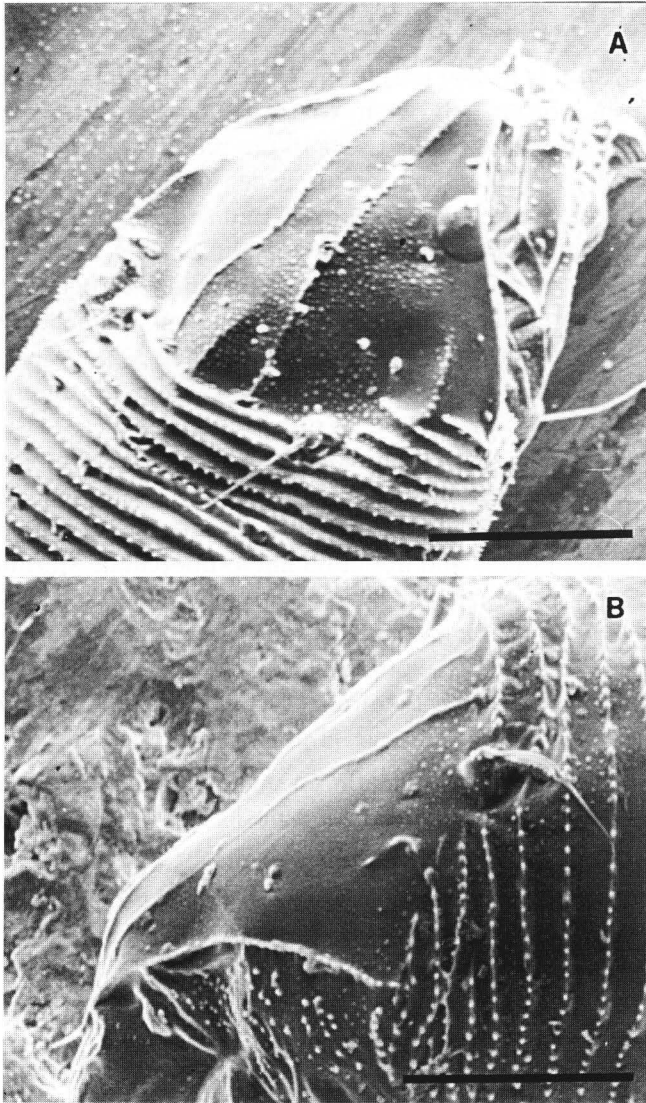


Fig. 2 - *V. montenegrinus* n. sp., S.E.M. micrographs: A) subdorsal view of anterior section; B) lateral view of anterior section. Scale bar = 20 μ m.

In *V. euphorbiae* Petanović the shield pattern is composed of 1 admedian and 1 submedian line on each side about 1/2 of shield length, the shield lobe is slightly rounded, 7 μ m long. Instead in the new species the shield patterns is composed of 1 short median, 2 very long admedians, and 2 short submedian lines, and the shield lobe is 15 μ m long (twice as long) and pointed.

Vasates glabriflorae n. sp. (figs 3-4)

Female: 181 μm (115-200 μm) long, 75 μm (55-87 μm) wide and 60 μm thick, fusiform, colour yellowish. Gnathosoma 22 μm long, projecting obliquely downwards, subapical seta 10 μm long, chelicerae 14 μm long. Dorsal shield 36 (36-48) μm long, 54 μm wide, semicircular, with an anterior pointed lobe 8 μm long. Shield pattern of 1 admedian line almost complete and 2 submedian lines on each side. Dorsal tubercles on the rear shield margin 23 μm apart with dorsal setae 22 μm long, directed to the rear. Foreleg 34 μm long, tibia 8 μm long, tarsus 6 μm long, solenidium 9 μm long, unknobbed, empodium 7 μm long, 7-rayed. Hindleg 30 μm long, tibia 6 μm long, tarsus 5 μm long, solenidium 8 μm long unknobbed, empodium 6 μm long. Coxae with ornamentation of numerous granules. First forecoxal tubercles 10 μm apart, setae 16 μm long, second forecoxal tubercles 10 μm apart, setae 25 μm long; hindcoxal tubercles 21 μm apart, setae 30 μm long. Sternal line 5 μm long, forked anteriorly. Opisthosoma with 44 (39-52) microtuberculate tergites and about 68 microtuberculate sternites. Lateral setae 30 μm long on sternite 14, 1st ventral setae 35 μm long on sternite 26; 2nd ventral setae 27 μm long on sternite 43; 3rd ventral setae 22 μm long on sternite 60. Last 8 rings with elongated tubercles. Caudal setae 45 μm long, accessory setae 6 μm long. Genitalia 14 μm long, 22 μm wide; genital coverflap with 10 striae; genital setae 11 μm apart, 13 μm long.

Male: 122 μm long, 54 μm wide, dorsal shield 36 μm long; dorsal tubercles 21 μm apart, dorsal setae 18 μm long; opisthosoma with about 42 tergites and about 57 sternites. Genitalia 18 μm wide.

Nymph II: 95 μm long; shield 27 μm long; dorsal tubercles 18 μm apart, dorsal setae 11 μm long; opisthosoma with about 50 rings; genital setae 8 μm apart, on sternite 8.

Host plant: *Euphorbia glabriflora* Vis., *E. amygdaloides* L., *E. capitulata* Reichenb., *E. serpentini* Novák. (Euphorbiaceae).

Relation to the host: shortening and drying of vegetative growths and deformations of the inflorescences.

Type material and locality: Holotype female on slide E16/3, date 10.06.1989; type locality: Mt. Zlatibor, Partizanske Vode, Serbia, collected by S. Jovanović. Paratypes 186, localities: Mt. Zlatibor, Partizanske Vode, 17.06.1990 and 19.05.1991, by S. Jovanović, Klisura Ibra, Ušće, 21.04.1990, collected by S. Jovanović, Maglič, 22.04.1990, collected by D. Lakušić, Mt. Tara, Kremna, 26.06.1990, collected by V. Stevanović, Mt. Sarplanina, Bre-

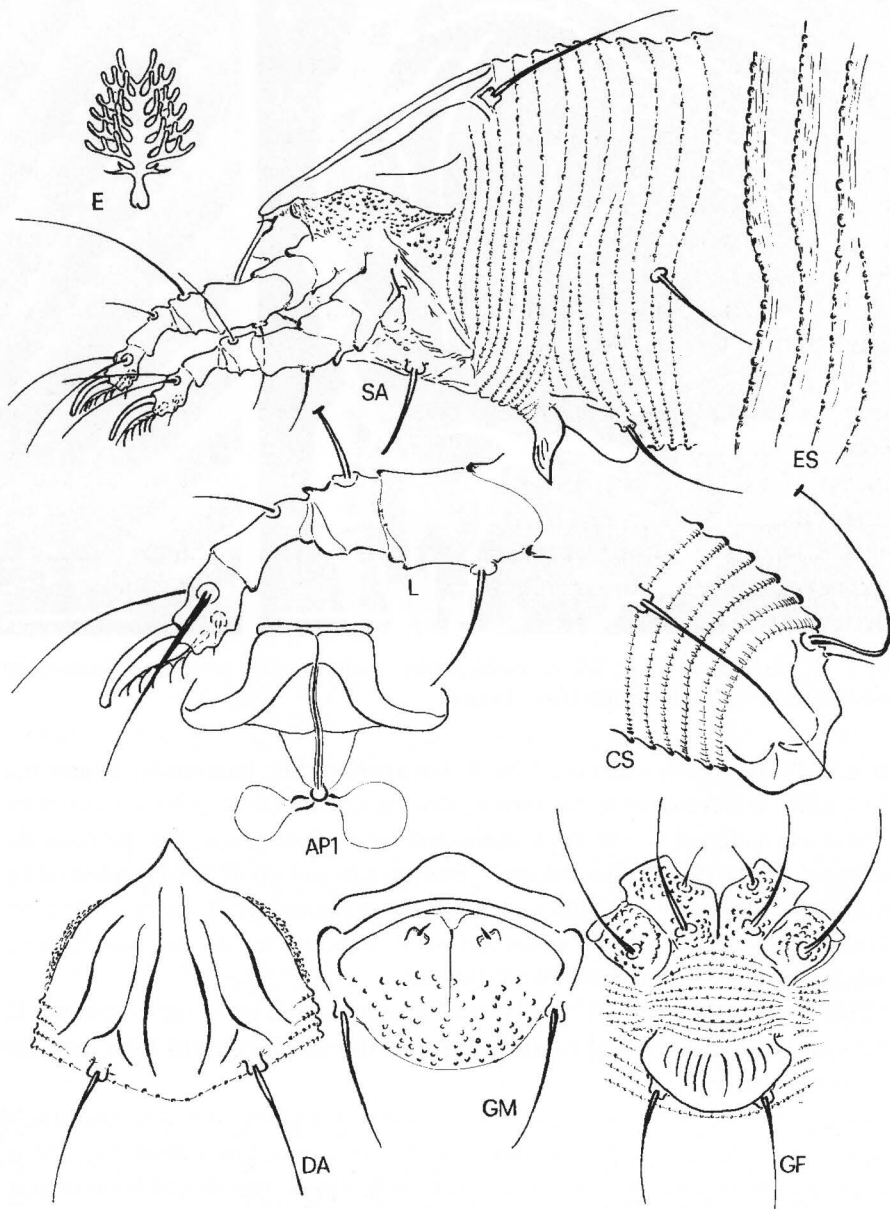


Fig. 3 - *Vasates glabriflorae* n. sp.

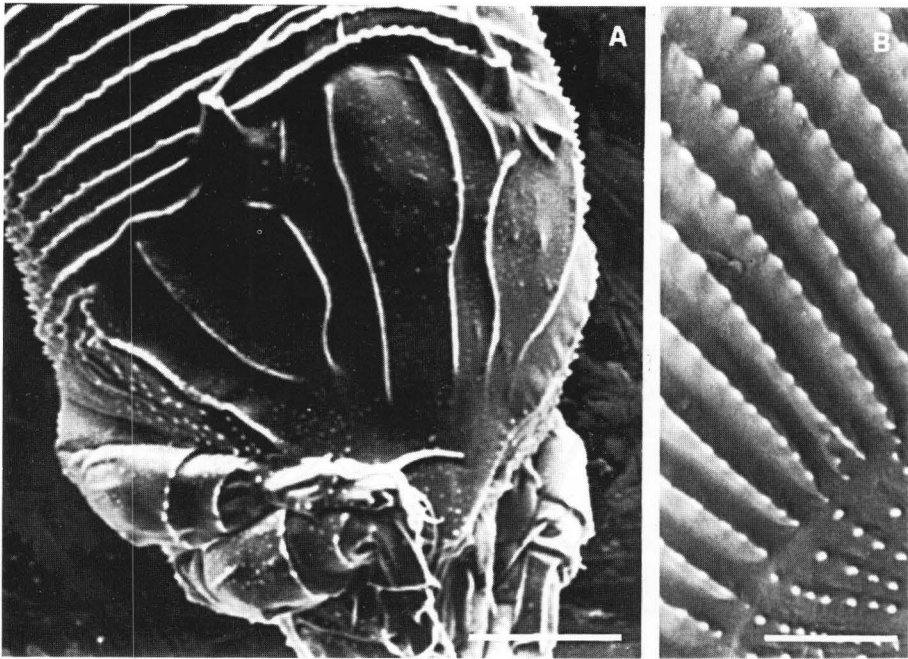


Fig. 4 - *V. glabriflorae* n. sp., S.E.M. micrographs: A) dorsal view of anterior section; B) details of microtubercles. Scale bar = 10 μ m.

zovica, 30.06.1990, collected by S. Jovanović, Mt. Durmitor, Kljestina, 07.07.1989, collected by R. Petanović, Crvena Greda, 06.07.1989, collected by V. Stevanović and 17.08.1991 collected by R. Petanović, Mt. Kopaonik, Srebrnac, 20.04.1990, collected by V. Stevanović and 06.07.1991, collected by D. Lakušić, Mt. Durmitor, Sušica, 26.08.1989, collected by B. Stojnić, Mt. Suva Planina, Mosor, 10.11.1990, collected by V. Stevanović, Mt. Kopaonik, Suvo Rudište, 05.07.1991, collected by D. Lakušić.

This species is close to *V. euphorbiae* Petanović and to *V. euphorbicolus* K. and can be distinguished by the shape of the dorsal shield lobe and the shield pattern.

In *V. euphorbiae* Petanović the shield lobe is slightly rounded, the shield pattern is composed of 1 admedian and 1 submedian line (about the 1/2 of shield length) on each side; in *V. euphorbicolus* K. the shield lobe is acuminate, rather short over the gnathosoma. The shield pattern is composed of strong lines.

In the new species the shield lobe is longer than in *V. euphorbicolus* K.

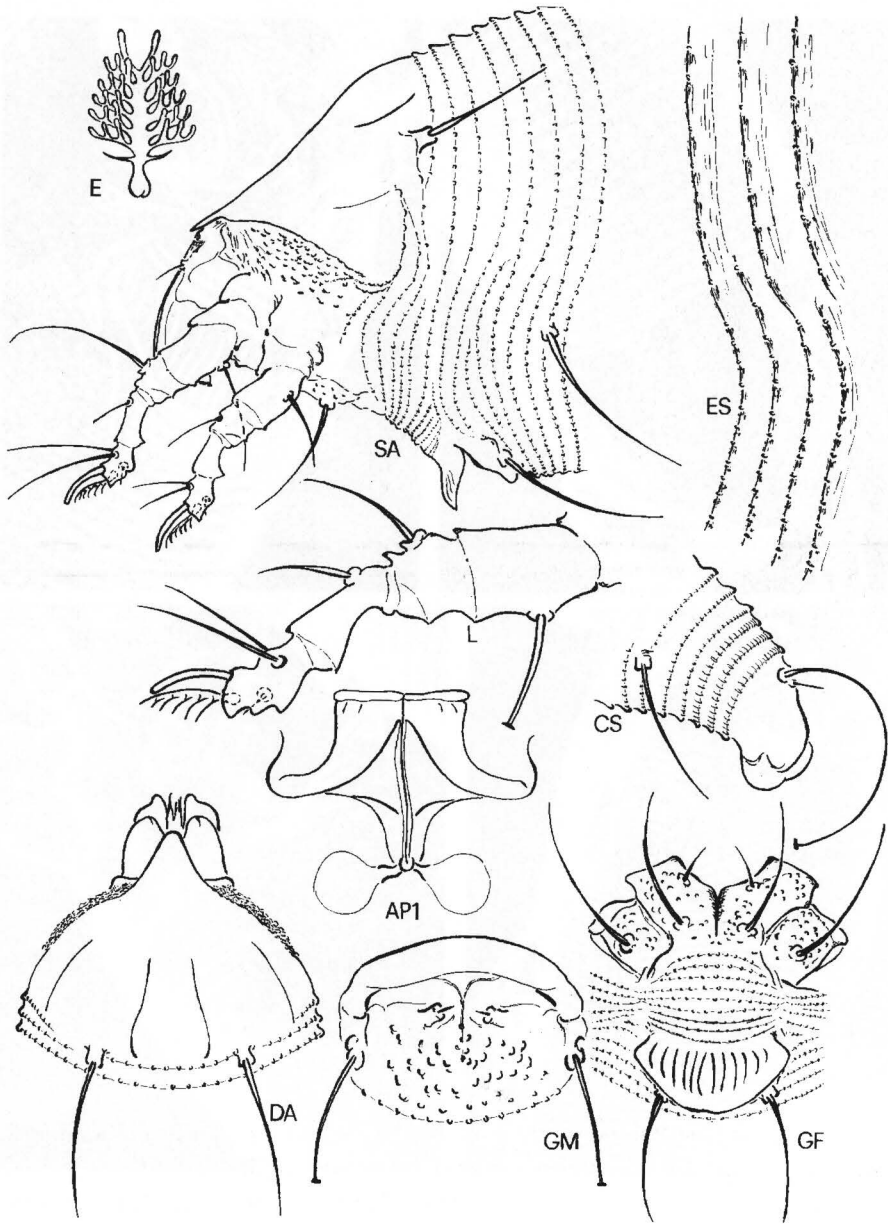


Fig. 5 - *Vasates euphorbiae* Petanović.

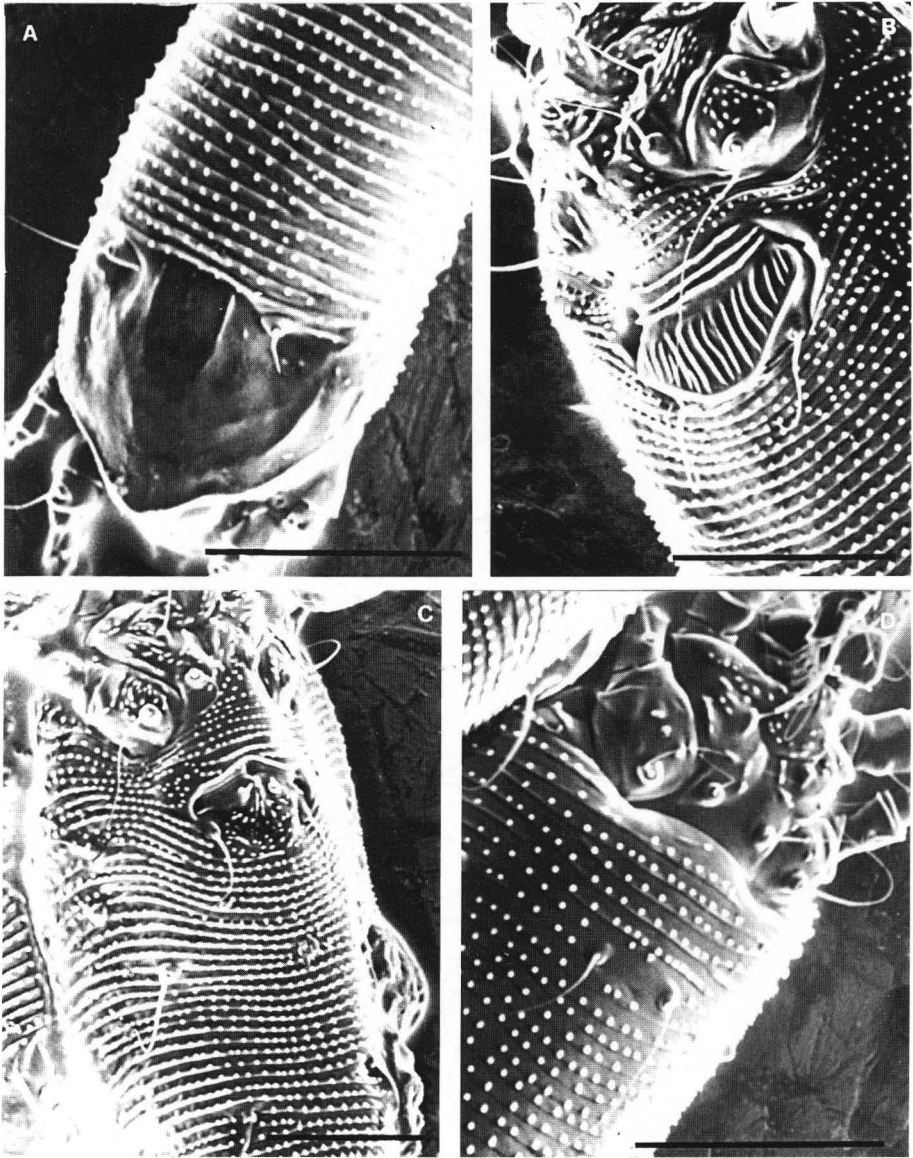


Fig. 6 - *V. euphorbiae* Petanović, S.E.M. micrographs: A) dorsal view of anterior section; B) coxae and external female genitalia; C) coxae and external male genitalia; D) coxae and genital region of nymph. Scale bar = 20 μ m.

and more similar in length to *V. euphorbiae* Petanovič, but acuminate. The shield pattern is composed of 1, almost complete admedian and 2 submedian lines on each side.

Vasates euphorbiae Petanovič (figs 5-6)

In the original description the dorsal shield is smooth, coxae are with short lines, female internal genitalia is presented without spermathecae.

Using the S.E.M., it has been possible to observe the shield pattern com-

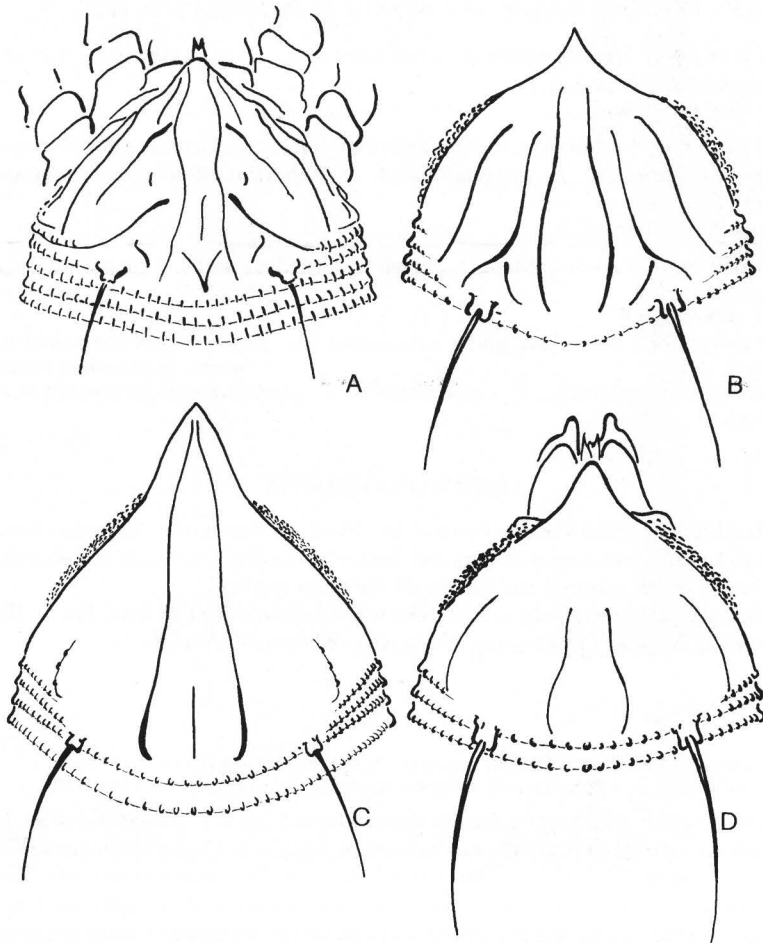


Fig. 7 - Dorsal view of anterior section: A) *Vasates euphorbicolus* (K.); B) *V. glabriflorae* n. sp.; C) *V. montenegrinus* n. sp.; D) *V. euphorbiae* Petanovič.

posed of 1 admedian, and 2 submedian lines on each side, about 1/2 of the shield length, the coxae with ornamentation of numerous granules, and more details on female and male genitalia.

This species was also found on *E. spinosa* L. at the following localities: Dubrovnik, Srdj, 25.05.1990, collected by V. Stevanović, Kanjon Morace, Platije, 11.06.1990, collected by D. Lakušić, Mt. Orjen, 16.06.1990 and 09.08.1991, collected by V. Stevanović, Boka, Radovici, 20.05.1991, and Budva, Brajčić, 22.05.1991, collected by S. Jovanović.

KEY TO *VASATES* SPP. FOUND ON *EUPHORBIA* SPP. (FIG. 7)

1. Shield lobe short. Shield pattern of strong lines *Vasates euphorbicolus* K.
on *Euphorbia corrolata* L.
- Shield lobe prominent 2
2. Shield pattern of 1 admedian and 2 submedian lines *Vasates glabriflorae* n. sp.
on *E. glabriflora* Vis., *E. amygdaloides* L., *E. capitulata* Reichenb., *E. serpentini*
Novák
- Shield pattern different 3
3. Shield pattern of 1 short median, 1 complete admedian and 1 short submedian line
on each side *Vasates montenegrinus* n. sp.
on *E. myrsinites* L.
- Shield pattern of 1 admedian, and 1 submedian line, almost 1/2 of the shield length
on each side *Vasates euphorbiae* Petanović
on *E. seguierana* Neck., *E. cyparissias* L., *E. glareosa* ssp. *panonica* M.B., *E.*
spinosa L.

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RIASSUNTO

DUE NUOVE SPECIE DEL GENERE *VASATES* (ACARI: ERIOPHYOIDEA) SU *EUPHORBIA* L.
IN JUGOSLAVIA CON NOTE MORFOLOGICHE SU *VASATES EUPHORBIAE* PETANOVIĆ

Vengono descritte ed illustrate *Vasates montenegrinus* n. sp. e *V. glabriflorae* n. sp. (Acari: Eriophyoidea) infedate su *Euphorbia* spp. raccolte in Jugoslavia. Queste specie causano disseccamento e riduzione della crescita delle piante e deformazione delle infiorescenze. Vengono inoltre riportate note morfologiche e più dettagliate illustrazioni di *V. euphorbiae* Petanović. Viene infine riportata una chiave dicotomica delle specie del genere *Vasates* finora note su *Euphorbia* spp.

Parole chiave: Eriofidi, *Euphorbia*, specie nuove.

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