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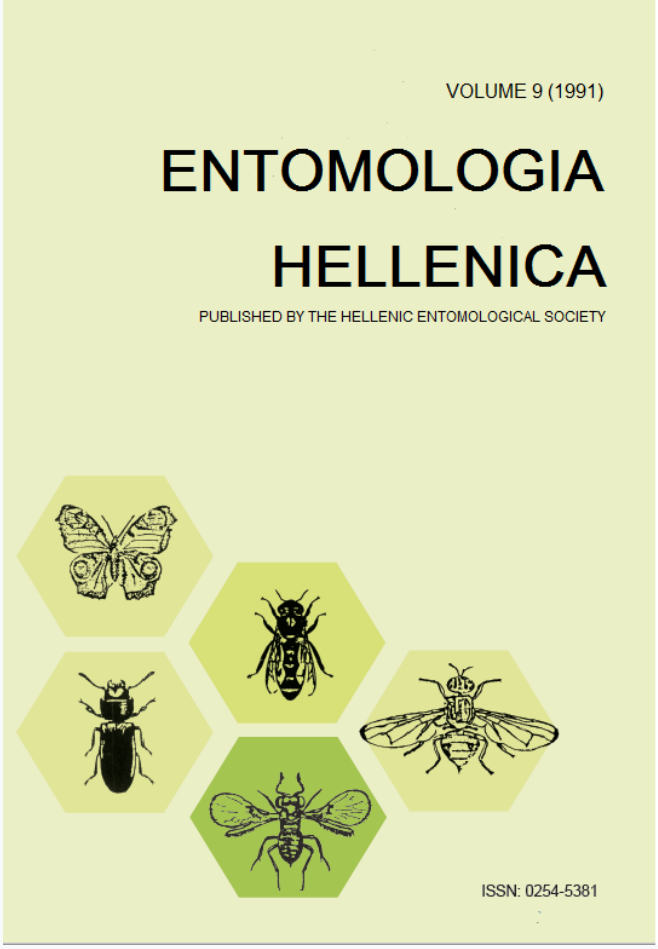

A Revision of the Genus Bryobia in Greece (Acari: Tetranychidae)

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ENTOMOLOGIA HELLENICA 9 (1991): 21-34

A Revision of the Genus *Bryobia* in Greece (Acari: Tetranychidae)[1]

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ABSTRACT

The genus *Bryobia* from Greece is revised and a key to 16 species is provided. Three new species, *B. caricae, B. cerasi* and *B. siliquae,* are described and illustrated. Four species, *B. artemisiae* Bagdasarian, *B. convolvulus* Tuttle and Baker, *B. vasiljevi* Reck and *B. watersi* Manson are recorded for the first time in this country. Information on the hosts, distribution and economic importance is presented for each species. Some of the hosts and damage symptoms are recorded for the first time.

Introduction

Bryobia Koch, 1836 is the largest genus in phytophagous mite subfamily Bryobiinae and contains several species of significant economic importance in many parts of the world. The adults of *Bryobia* species have 4 pairs of setae on propodosoma; anterior two pairs of which (v_1, v_2) usually located on prominent projections over gnathosoma; 12 pairs of dorsal hysterosomal setae: 1 pair of humeral (c_3), 7 pairs of dorsolateral and 4 pairs of dorsocentral, fourth pair (f_1) of which is usually marginal. The peritremes either end simply or form an anastomosis distally. Legs with coxal formula 2-1-1-1; genu I usually with not more than 8 setae; all the true claws or at least those of tarsi II-IV uncinate and provided with tenent hairs; empodium of tarsus I may have one or more pair of tenent hairs. Spermatheca is of significance in species identification as well as the shape, size and dorsal setation of larvae. The knowledge of *Bryobia* mite fauna in Greece is relatively poorly known. Pelekassis (1962) reported *B. praetiosa* and later Hatzinikolis (1968, 1969, 1987) reported eight more species: *B. kissophila, B. cristata, B. prunicola, B. rubrioculus, B. longisetis, B. sarothamni, B. tilia* and *ulmophila*. Recently Hatzinikolis and Emmanouel (1991) reported *B. attica* spec. nov. from *Olea europaea*.

Material and Methods

The material for this study has been assembled at the Acarology Laboratory, during the period 1966-1990 from plant samples which were provided by Agricultural Institutions, local Agricultural Services, individuals or collected by the first author. Methods of collecting, killing, preservation, clearing, pigmentation, fixing and mounting were described by Hatzinikolis (1982). Most of the samples were collected in the eastern part of Greece, including Macedonia, and to a lesser extent in western Greece, Thrace and the Islands. The great majority of samples was taken from various parts of cultivated fruit trees, vegetables, ornamental plants, fodder, grapes and crops cultivated for the food processing industry. A limited number of samples was taken from cereals, forest trees and various indigenous plants. All the material is deposited in the collection of Acarology Laboratory of the Agricultural Research Center of Athens, Greece. All measurements are given in microns (μm).

[1] Received for publication December 31, 1991.

Results and Discussion

The present study has revealed the presence of *B. caricae* spec. nov., *B. cerasi* spec. nov., *B. siliquae* spec. nov., *B. artemisiae*, *B. convolvulus*, *B. vasiljevi* and *B. watersi* in addition to the ten previously known species. Females and larvae of the new species are discribed and illustrated.

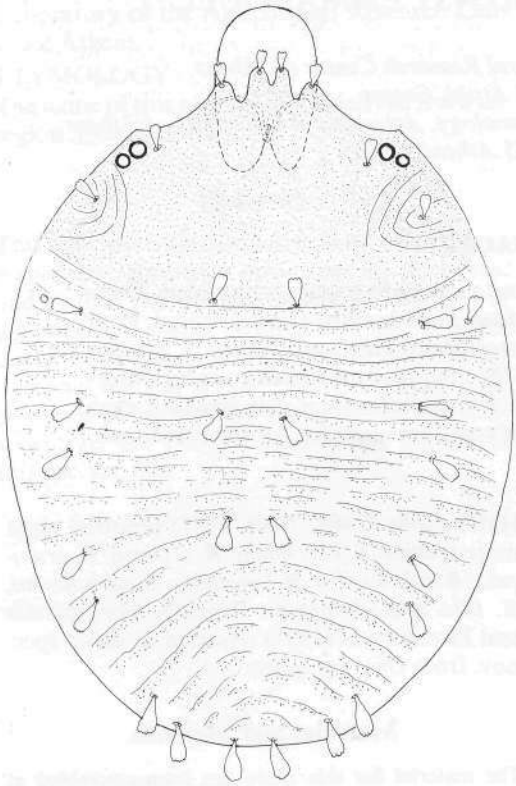

FIG. 1. *Bryobia cerasi* spec. nov., female, dorsal view.

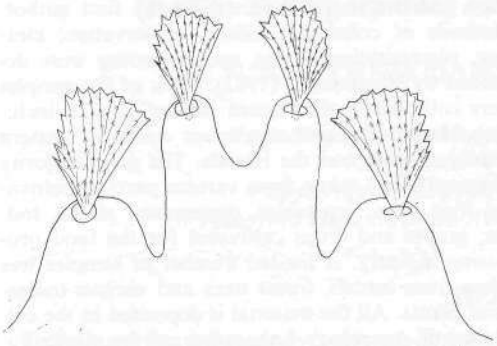

FIG. 2. *Bryobia cerasi* spec. nov., female, propodorsal lobes.

The symptoms induced by the 16 *Bryobia* species are briefly described, along with some observations on their behaviour and host range. A key based on the female and larva is provided.

a. Description of new species

Bryobia cerasi spec. nov.

FEMALE

Dimension of holotype (measurements in parentheses are variations in paratypes); length of body (including gnathosoma) 628 (602-628); length (excluding gnathosoma) 576 (561-583); breadth 501 (473-504). Length of legs: I 583 (570-579), II 363, III 424, IV 485.

Dorsum (Fig. 1). Anterior angulation developed; propodosomal lobes (Fig. 2) strongly developed; outer propodosomal lobes bluntly conical; median propodosomal lobes teat-like; setae on propodosomal lobes spatulate, serrate (Fig. 2); first pair of propodosomal setae (v_1) 16, about three-fourth the length of second pair (v_2), 20; dorsal body setae (Fig. 3) spatulate, serrate 26-30 long and 14-16 wide; dorsal integument of propodosoma with few striae laterally, densely granulate; dorsal integument of hysterosoma densely granulate only behind each of the striae; striae between first (c_1) and second dorsocentral setae (d_1) slightly curved and bet-

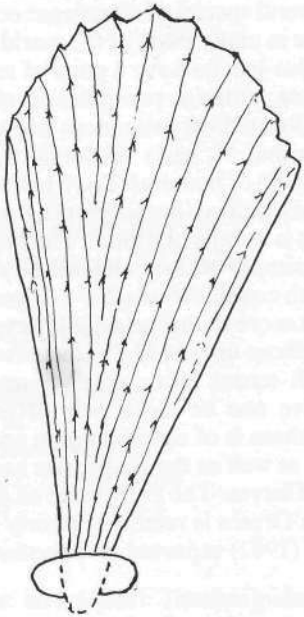

FIG. 3. *Bryobia cerasi* spec. nov., female, a dorsal seta.

ween dorsocentral and dorsolateral setae slightly concave; striae posteriorly the second dorsocentral setae (d_1) become more irregular and curved towards opisthosoma.

Gnathosoma. Stylophore rounded distally; palpal claw bidental; palpatarsus with 3 tactile setae, one solenidion and 3 eupathidia; peritreme ends in a pyriform anastomosing chamber (Fig. 4) 23-26 long and 11-12 wide.

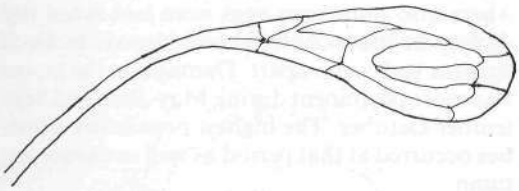

FIG. 4. *Bryobia cerasi* spec. nov., female, distal of peritreme.

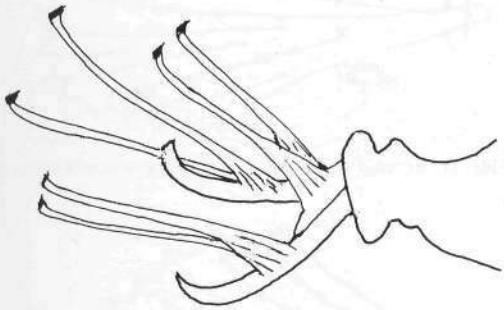

FIG. 5. *Bryobia cerasi* spec. nov., female, tarsal appendages of tarsus I.

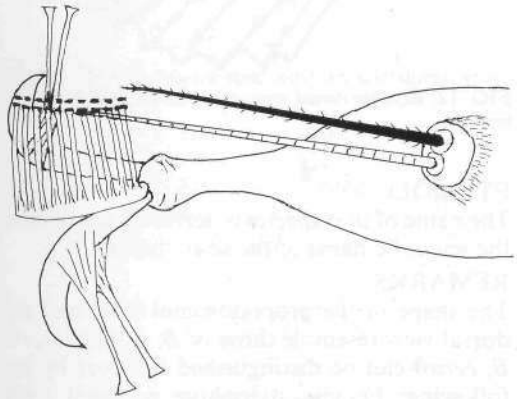

FIG. 6. *Bryobia cerasi* spec. nov., female, duplex setae on tarsus III.

Legs. Leg setae and solenidia (in parentheses) as follows: coxae 2-1-1-1; trochanters 1-1-1-1; femora 15 or 16-12-7-7; genua 8-5-5-5; tibia 14 (1)-9-9-9; tarsi 18 (3) + 2 dupl. -13 (2) + 1 dupl. -12 + 1 dupl. -14 (1); true claws uncinate bearing one pair of tenent hairs; empodium I (Fig. 5) pad-like abruptly narrow one third the length of the true claws and with one pair of tenent hairs; empodium II, III and IV pad-like narrowed distally about three fourth the length of true claws each provided with two rows of 8, 10 and 12 tenent hairs respectively; duplex setae of tarsus III (Fig. 6) with tactile seta about six-sevenths the length of solenidion; solenidia IV (Fig. 7) not associated with tactile setae and about seven-tenths the length of tactile setae.

Spermatheca. The sacculus is elongate club-shape (Fig. 8).

DEUTONYMPH

Anterior lobes on propodosoma shorter than those of female; first propodosomal setae about half the length of the second one; dorsal body setae sub-spatulate.

LARVA

First (v_1) and second (v_2) propodosomal setae very slender lanceolate and filiform respectively (Fig. 9) subequal in length and located characteristically more posteriorly than usual (Fig. 10); rest of dorsal body setae slender spatulate serrate (Fig. 11) 18-22 long and 5-7 wide except

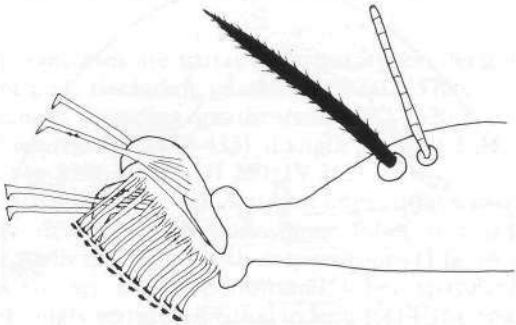

FIG. 7. *Bryobia cerasi* spec. nov., female, solenidion and tactile seta on tarsus IV.

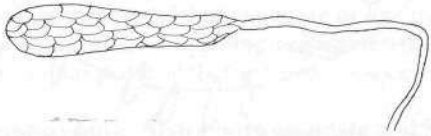

FIG. 8. *Bryobia cerasi* spec. nov., female, spermatheca.

the second dorsocentrals (d_1) which are short (12) and wide (8) (Fig. 12); humeral setae (c_3) usually found in a more lateral position characteristically located near the first (c_2) and in line with the rest dorsolateral setae; integument of propodosoma granulate; integument of hysterosoma sparsely granulate with few wavy transverse striae; empodium pad-like and about half the length of true claws; each claw and empodium bears a pair of tenent hairs.

MALE Unknown.

NATURAL COLOUR

The female is dark brown-red, the nymph is blackish green and the larva is orangish-red.

TYPE MATERIAL

The holotype female, 5 paratype females, 5 paratype nymphs and 6 paratype larvae from *Prunus cerasus* L. (sour cherry), 22 July 1982 (Code Number 11/82) near Aliartos Experimental Station, Boeotia, Greece; 3 paratype females and 2 paratype larvae 19 October 1982 (Code 73/82) and 3 paratype females and 4 paratype larvae in the park of Cotton Organization of Greece, Aliartos. This material was collected by the first author from isolated trees and is mounted on twelve slides.

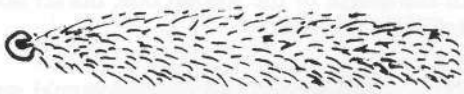

FIG. 9. *Bryobia cerasi* spec. nov., larva, 2nd propodosomal seta (v_2).

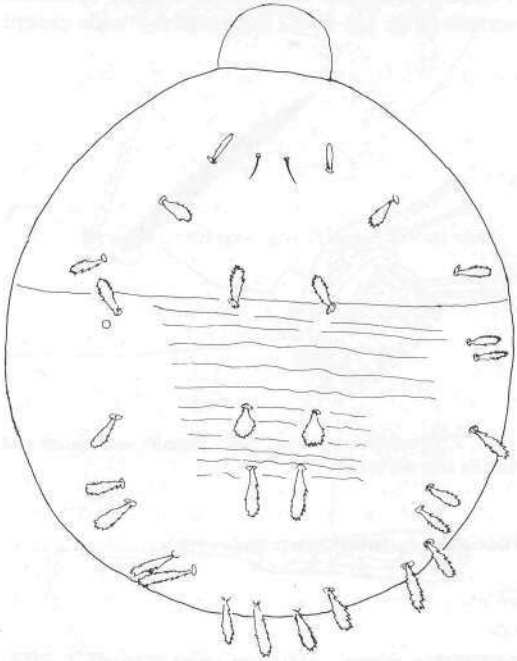

FIG. 10. *Bryobia cerasi* spec. nov., larva, dorsal view.

RELATION TO HOST

The mites were observed all year round on the upper surface of the leaves near the main vein where also numerous eggs were laid especially during the more cool and humid periods. Each egg was laid 5 mm apart. Damage on the leaves was more prominent during May-June and September-October. The highest population densities occurred at that period as well as during autumn.

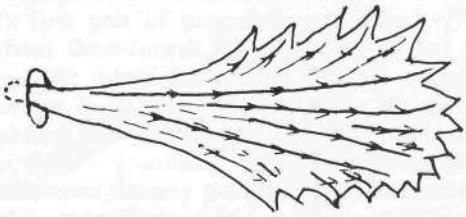

FIG. 11. *Bryobia cerasi* spec. nov., larva, a dorsal seta.

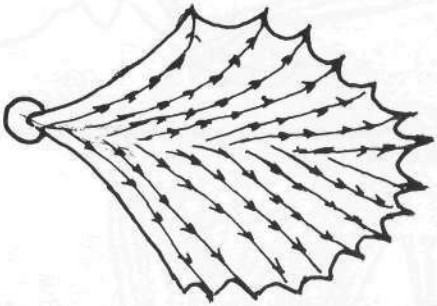

FIG. 12. *Bryobia cerasi* spec. nov., larva, 2nd dorsocentral (d_1).

ETYMOLOGY

The name of that species is derived from *cerasus* the scientific name of the sour cherry.

REMARKS

The shape of the propodosomal lobes and the dorsal view resemble those of *B. vasiljevi* Reck; *B. cerasi* can be distinguished however by the following: Female stylophore rounded anteriorly, genua setal formula 8-5-5-5, duplex setae on tarsus III, peritreme pyriform 21-25 long

and 10-12 wide. Larval dorsal setae slender spatulate except the short and wide second dorsocentrals (d_1); fourth dorsocentral setae (f_1) marginal, humeral (c_3) and first dorsocentrals (c_1) very close and in line with other dorsolateral setae; second propodosomal setae (v_2) filiform differing from the rest slender spatulate propodosomals and located slightly posteriorly to first propodosomals (c_1).

Bryobia siliquae spec. nov.

FEMALE

Dimension of holotype (measurements in parentheses are variation in paratypes): length of body (including gnathosoma) 602 (570-614); length (exluding gnathosoma) 522 (520-526); breadth 437 (428-435). Length of legs: I 553 (549-559), II 237, III 269, IV 262.

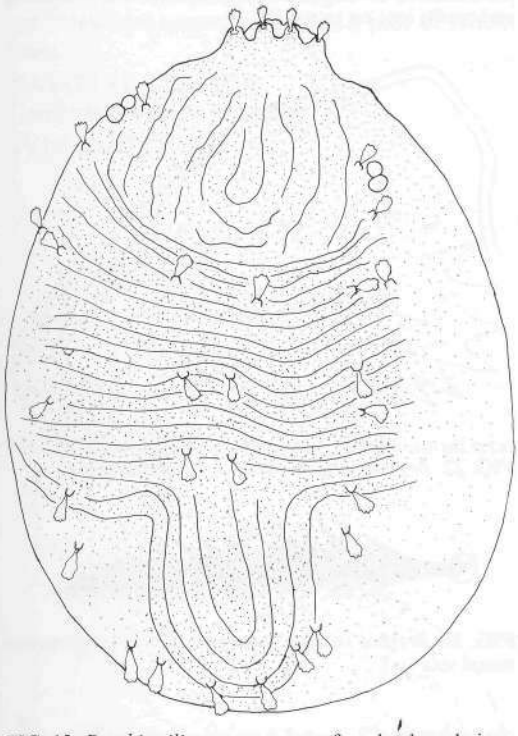

FIG. 13. *Bryobia siliquae* spec. nov., female, dorsal view.

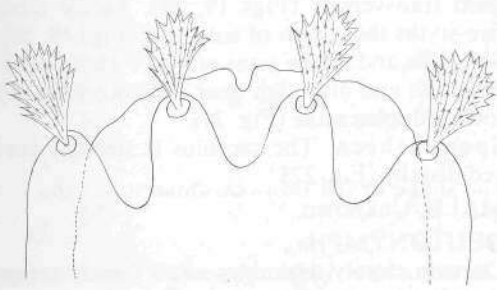

FIG. 14. *Bryobia siliquae* spec. nov., female, propodorsal lobes.

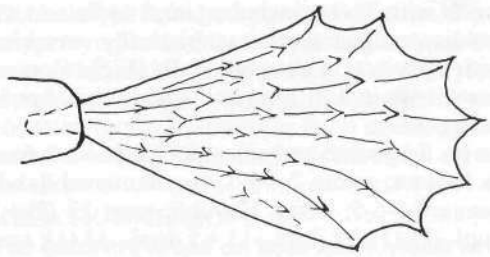

FIG. 15. *Bryobia siliquae* spec. nov., female, a dorsal seta.

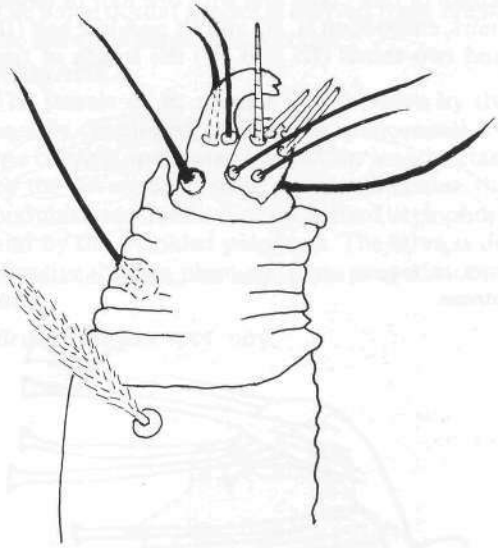

FIG. 16. *Bryobia siliquae* spec. nov., female, palp.

Dorsum (Fig. 13). Anterior angulation weakly developed; propodosomal lobes teat-like equally developed with deep incisions (Fig. 14); setae set on propodosomal lobes spatulate strongly serrate subequal in length (14-16); rest of dorsal setae 20-25 long and 11-14 wide set on small prominent lobes (Fig. 15); dorsal integument of propodosoma granulate with irregular longitudinal striae; dorsal integument of hysterosoma granulate with striae more or less transverse anteriorly becoming characteristically longitudinal posteriorly the third dorsocentrals (e_1).

Gnathosoma. Stylophore undulate and incised mediodistally; palpal claw bidental; palpa-

tarsus with 7 setae including eupathidia and solenidia; palpgenu characteristically wrinkled with a projection anterolaterally (Fig. 16); peritreme ends in a 21 long and 8 wide chamber as in Fig. 17.

Legs. Leg setae and solenidia (in parentheses) as follows: coxae 2-1-1-1; trochanters 1-1-1-1; genua 8-5-5-5; tibiae 12-9-9-9; tarsi 22 (2)+2 dupl. -11 (1)+1 dupl. -11+1 dupl. -11 (1); true claws uncinate bearing a pair of tenent hairs; empodium I (Fig. 18) pad-like one fourth the length of true claws and with one pair of tenent hairs; empodium II, III and IV pad-like half (II) and two thirds (III and IV) the length of true claws having 2, 4 and 4 pairs of tenent hairs respectively; two members of duplex setae (III) aligned transversely (Figs 19, 20). Tactile setae five-sixths the length of solenidia (Figs 19, 20). Solenidia and tactile setae of leg IV about equal in length and although near each other do not form a duplex setae (Fig. 21).

Spermatheca. The sacculus is strongly curved distally (Fig. 22).

MALE. Unknown.

DEUTONYMPH

Dorsum closely resembles adult female except that first (v_1) and second (v_2) propodosomal setae are subspatulate.

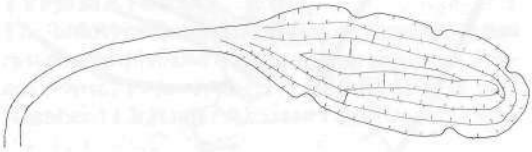

FIG. 17. *Bryobia siliquae* spec. nov., female, distal of pertitreme.

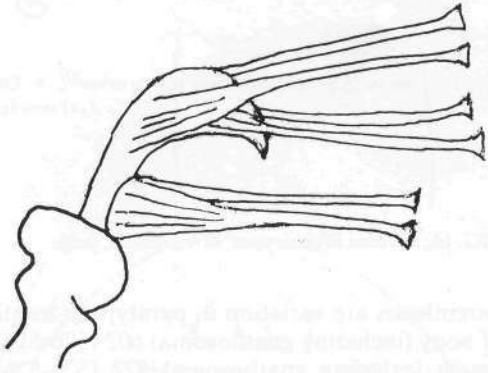

FIG. 18. *Bryobia siliquae* spec. nov., female, tarsal appendages of tarsus I.

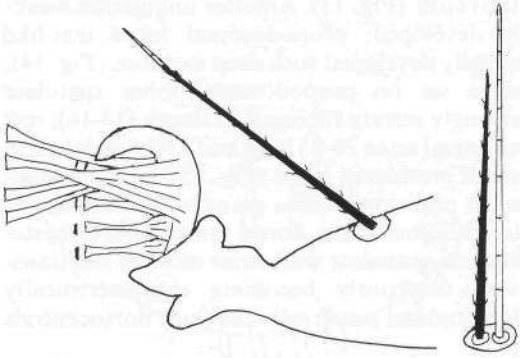

FIG. 19-20. *Bryobia siliquae* spec. nov., female, duplex setae on tarsus III.

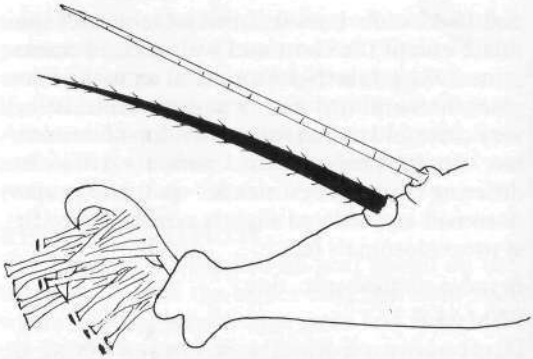

FIG. 21. *Bryobia siliquae* spec. nov., female, solenidion and tactile seta on tarsus IV.

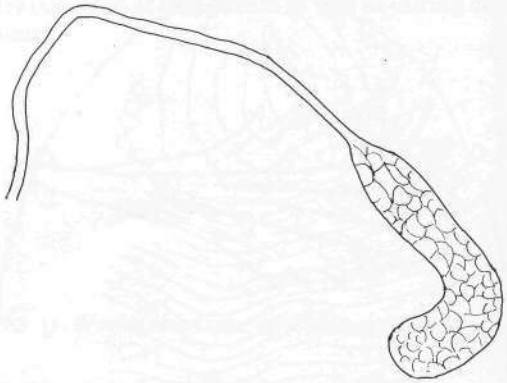

FIG. 22. *Bryobia siliquae* spec. nov., spermatheca.

FIG. 23. *Bryobia siliquae* spec. nov., larva, 1st propodosomal seta (v_1).

LARVA

First pair of propodosomal setae (v_1) plumose (Fig. 23) half the length of the second one (v_2) located marginally almost in line with it; all rest dorsal body setae set on prominent tubercules, slender strongly serrate spatulate (Fig. 24) 16-24 long and 6-9 wide except first propodosomals (c_1) and humerals (c_3) which are distinctly shorter, about 10 long; f_1, f_2 and h_1 almost in a line. Integument of hysterosoma granulate with few striae laterally; integument of the hysterosoma granulate with several transverse to irregular widely spaced striae (Fig. 25). Empodium pads about one third the length of true claws; each claw and empodium bears a pair of tenent hairs.

NATURAL COLOUR

Greenish brown in all stages.

TYPE MATERIAL

The holotype female, 2 paratype females, 2 paratype nymphs and 2 paratype larvae from *Ceratonia siliqua* L. (carob tree) 18-9-85 Tyros, Kynouria, Arcadia, Greece. This material was collected by the first author from isolated trees near the village Tyros and it is mounted on three slides.

RELATION TO HOST

The mites are found on both leaf surfaces near the main vein.

ETYMOLOGY

The name of that species is derived from *siliqua* the scientific name of carob tree.

REMARKS

The female of *B. siliquae* is distinctive by the equally developed teat-like propodosomal lobes bearing spatulate subequal in length setae; by the dorsal body setae set on tubercules; the undulate and mediodistally incised stylophore and by the wrinkled palpgenu. The larva is distinctive by its plumose first propodosomal setae.

Bryobia caricae spec. nov.

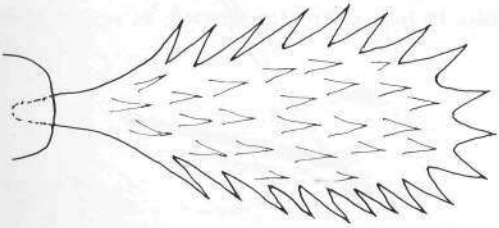

FIG. 24. *Bryobia siliquae* spec. nov., larva, a dorsal seta.

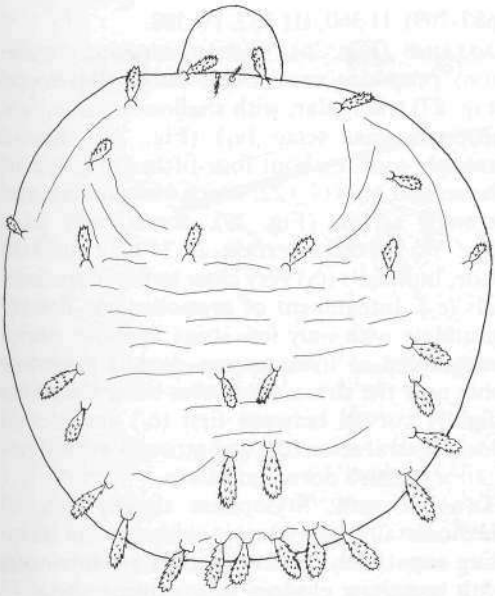

FIG. 25. *Bryobia siliquae* spec. nov., larva, dorsal view.

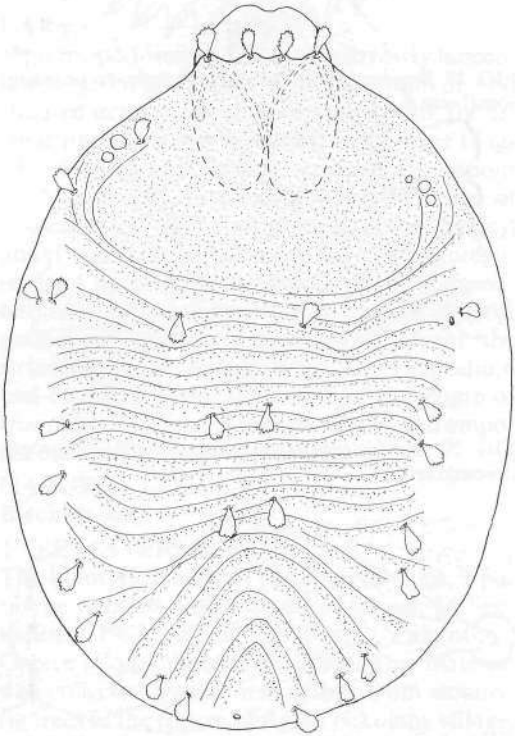

FIG. 26. *Bryobia caricae* spec. nov., female, dorsal view.

FEMALE

Dimension of holotype (measurements in parentheses are variation in paratypes); length of body (including gnathosoma) 656 (638-663); length (exluding gnathosoma) 551 (531-562); breadth 482 (470-488). Length of legs: I 700 (687-709), II 360, III 352, IV 388.

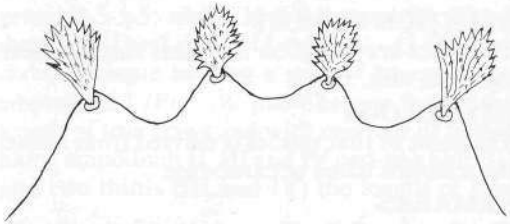

FIG. 27. *Bryobia caricae* spec. nov., female, propodorsal lobes.

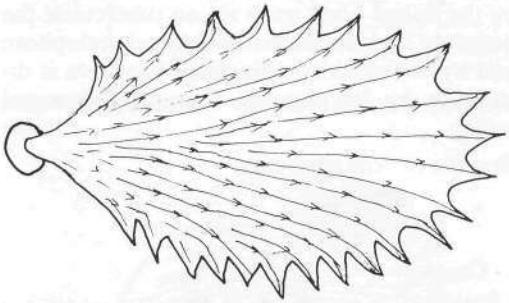

FIG. 28. *Bryobia caricae* spec. nov., female, 1st propodosomal seta (v_1).

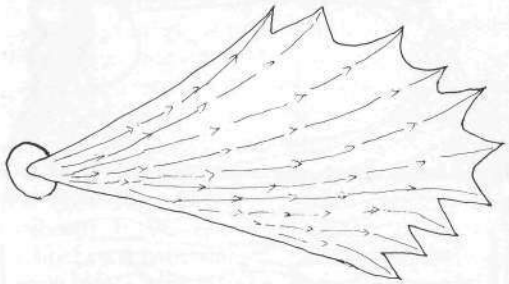

FIG. 29. *Bryobia caricae* spec. nov., female, 2nd propodosomal seta (v_2).

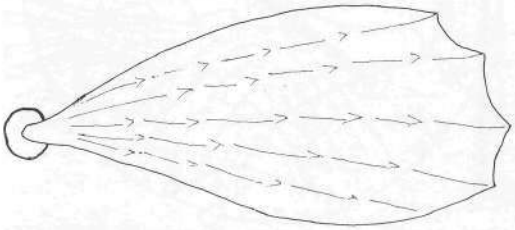

FIG. 30. *Bryobia caricae* spec. nov., female, dorsal seta.

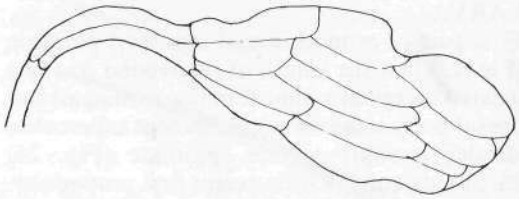

FIG. 31. *Bryobia caricae* spec. nov., female, distal of peritreme.

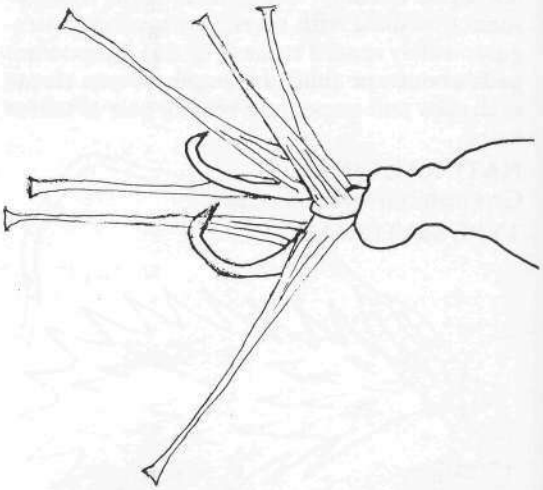

FIG. 32. *Bryobia caricae* spec. nov., female, tarsal appendages of tarsus I.

Dorsum (Fig. 26). Without anterior angulation; propodosomal lobes weakly developed (Fig. 27) triangular, with shallow incision; first propodosomal setae (v_1) (Fig. 28) elipsoid strongly serrate about four-fifths the length of the second ones (v_2) 22, which are spatulate and strongly serrate (Fig. 29), dorsal body setae (Fig. 30) spatulate serrate, 20-24 long and 8-10 wide; humerals (c_3) very close to first dorsolaterals (c_2). Integument of propodosoma densely granulate with only few striae laterally; dorsal integument of hysterosoma densely granulate only near the striae; transverse striae becoming slightly curved between first (c_1) and second dorsocentral setae (d_1) and strongly curved posterior to third dorsocentrals (e_1).

Gnathosoma. Stylophore slightly notched mediodistally; palpatarsus with 6 setae including eupathidia; peritreme ends anastomosing with somehow elipsoid enlargement about 37 long and 17 wide (Fig. 31).

Legs. Number of setae and solenidia (in parentheses) as follows: coxae 2-1-1-1 trochanters 1-1-1-1; femora 16-9-5-5; genua 8-5-5-5; tibiae 14 (2)-9-9-9; tarsi 24 (6) + 2 dupl. -13 + 1 dupl. -13 (1) -14 (1); true claws uncinate bearing one pair tenent setae; empodium I (Fig. 32) pad-like about one fourth the length of true claws with one pair of tenent hairs; empodium II, III and IV pad-like about three fourths the length of true claws each provided with two rows of 6 or 7 tenent (Figs 33, 34); solenidia of tarsi III and IV not associated with tactile setae; solenidion about half the length and about one and half the length of tactile seta in tarsus IV and III respectively (Figs 33, 34).

Spermatheca. The sacculus is elongate (Fig. 35).

MALE. Unknown.

NYMPH

Anterior lobes of propodosoma shorter than in female; rest of dorsum resembles that of adult female.

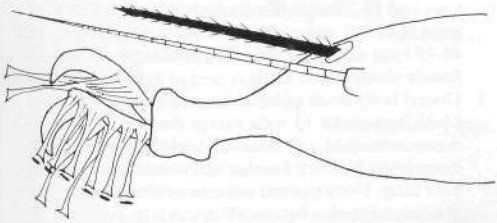

FIG. 33. *Bryobia caricae* spec. nov., female, solenidion and tactile seta on tarsus IV.

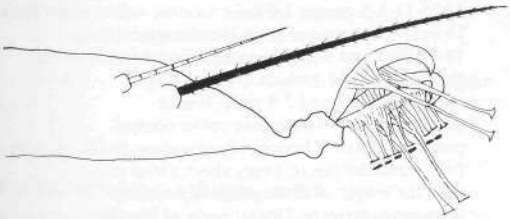

FIG. 34. *Bryobia caricae* spec. nov., female, solenidion and tactile seta on tarsus III.

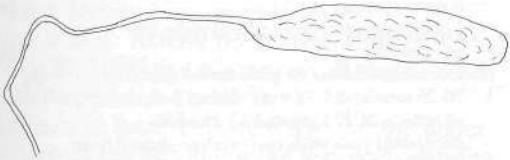

FIG. 35. *Bryobia caricae* spec. nov., female, spermatheca.

FIG. 36. *Bryobia caricae* spec. nov., larva, 1st propodosomal seta (v_1).

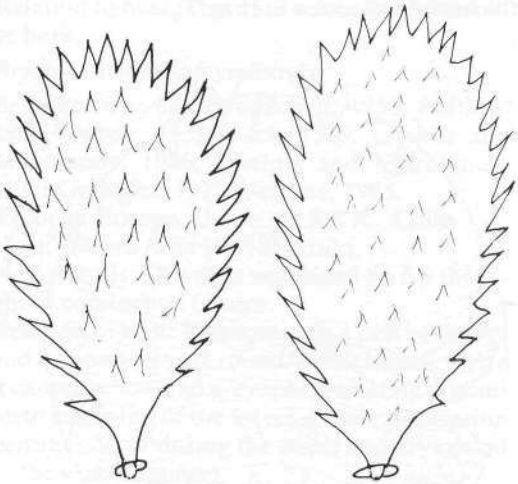

FIG. 37-38. *Bryobia caricae* spec. nov., larva, dorsal setae.

LARVA

First propodosomal setae (v_1) narrowly lanceolate (Fig. 36) about two thirds the length of, and situated in an about transverse line with, the second ones (v_2); rest of dorsal body setae (Figs 37, 38) large spatulate strongly serrate, about 16-20 in length. Interval between the bases of humerals (c_3) and first dorsolateral setae (c_2) about equal in length with the latter. Integument of propodosoma smooth sparsely granulate only posterolaterally; Integument of propodosoma sparsely granulate only near the striae as in the female (Fig. 39). Empodium pad-like narrow distally one third the length of true claws of tarsus II and III. Claws and empodia each with a pair of tenent hairs.

NATURAL COLOUR

Blackish-red.

TYPE MATERIAL

The holotype female, 4 paratype females, 3 paratype nymphs and 3 paratype larvae, 14 September 1983, Agios Nikolaos, Zakynthos, Greece (Code Number 43/1983). This material was collected by the first author from isolated fig trees in the region of Agios Nikolaos village, Zakynthos island, and it is mounted on six slides.

RELATION TO HOST

The mites were found on the undersurface of the leaves near the main rib.

ETYMOLOGY

The name is derived by the scientific name of the host *Ficus carica* L. (Fig. 3).

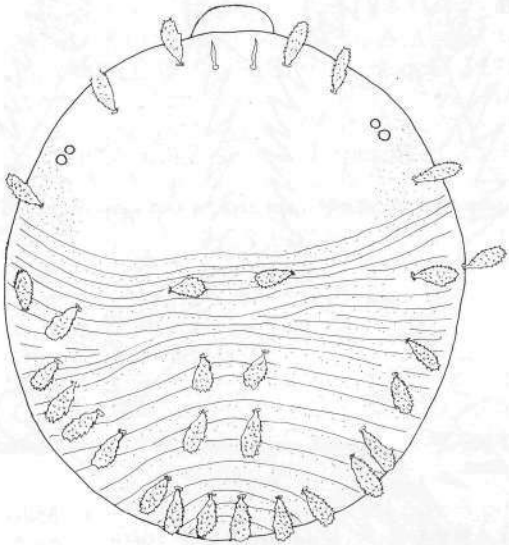

FIG. 39. *Bryobia caricae* spec. nov., larva, dorsal view.

REMARKS

The anterior lobes of the female resemble those of *B. siliquae* sp. nov. but it can be readily distinguished by the dorsal body setae which on *B. caricae* are not set on tubercules, by the absense of propodosomal striae, the different pattern of opisthosomal striae and by the short distance between the humeral and first dorsocentral seta (c_1).

b. Key to the Greek species of *Bryobia* based on females and larvae.

1. Propodosomal lobes well developed 2
– Propodosomal lobes poorly developed or absent 12
2. Anterior angulation strongly developed; tarsus IV dorsally with duplex setae 3
– Anterior angulation absent: tarsus IV dorsally without duplex setae 9
3. Claws II-IV with 2 pairs tenent setae 4
– Claws II-IV with 1 pair tenent setae 5
4. Dorsal body setae of larva lanceolate 16-18 long and 3-4 wide; dorsal setae of female 28-35 long and 12-15 wide; tibia I with 13 setae; peritremal enlargement 40-46 long and 14-16 wide ..... *B. attica* Hatzinikolis and Emmanouel
– Dorsal body setae of larva slender spatulate, 27-36 long and 5-7 wide; dorsal body setae of female 20-26 long and 6-9 wide; tibia I with 16-17 setae; peritremal enlargement 36-42 long and 10-12 wide ..... *B. kissophila* Van Eyndhoven
5. Dorsal body setae of larva spatulate 6
– Dorsal body setae of larva filiform, 30-40 long; dorsal body setae of female 22-25 long and 15-18 wide; femur I with 19-21 setae; peritremal enlargement 36-40 long and 13-15 wide ..... *B. cristata* (Dugès)
6. Hysterosomal body setae of larva about equal in length 7
– Hysterosomal body setae of larva different in length or and shape 8
7. Fourth pair of dorsocentral setae (f_1) of larva in normal position; dorsal body setae on larva slender spatulate 22-28 long and 5-8 wide; dorsal body setae of female 20-33 long and 15-17 wide; femur I with 20-22 setae; genu II with 6 setae; peritremal enlargement 48-56 long and 13-15 wide; length of leg I of female longer than body ..... *B. praetiosa* Koch
– Fourth pair of dorsocentral setae (f_1) of larva in an almost marginal position; dorsal body setae of larva widely spatulate 21-24 long and 16-20 wide; dorsal body setae of female 20-24 long and 18-21 wide; femur I with 18-20 setae; genu II with 5 setae; peritremal enlargement 40-45 long and 9-11 wide; length of leg I of female shorter than body ..... *B. watersi* Manson
8. Dorsal body setae of larva large spatulate 17-21 long and 8-13 wide except the 2nd dorsocentrals (d_1) and 2nd (d_2) and 4th (e_2) dorsolaterals which are distinctly shorter, 8-13 long. Dorsocentral setae in normal position; distance between humerals (c_3) and first dorsocentrals (c_1) three times the length of those setae. Stylophore incised anteriorly. Dorsal body setae of female spatulate, 21-25 long 13-18 wide. Setal formula of femora 24 or 25-11-5-5; genua 7-6-6-6 ..... *B. vasiljevi* Reck
– Dorsal body setae of larva slender spatulate 18-22 long and 5-7 wide except the second dorsocentrals (d_1) which are very large spatulate 10-12 and 7-8 wide; fourth dorsocentrals (f_1) marginal not in normal position; distance between humerals (c_3) and first dorsocentrals (c_1) very short about one thirt the length of those setae. Stylophore rounded anteriorly. Dorsal body of femaly spatulate 26-30 long and 14-16 wide. Setal formula of femora 15 or 16-12-7-7; genua 8-5-5-5 ..... *B. cerasi* nov. spec.
9. Lobes on prodorsum with spine-like outgrowths 10
– Lobes on prodorsum without spine-like outgrowths 11
10. Dorsal body setae of larva broad spatulate 20-26 long and 9-12 wide; dorsal body setae of female 24-27 long and 13-16 wide; peritremal ends with two sausage-shaped lines 16-19 long and 6-8 wide; femora I with 15-18 setae ..... *B. rubrioculus* (Scheuten)

- Dorsal body setae of larva slender spatulate 21-26 long and 4-5 wide; dorsal body setae of female 22-25 long and 12-16 wide; peritremal ends with four or five sausage-shaped lines 24-27 long and 16-19 wide; femora I with 16-20 setae ..... *B. rubrioculus* f. *prunicola* Mathys

11. Femora I and II with 18 and 11 setae; genu I with 7 setae; solenidia on tarsi IV half the length of associated tactile setae; peritremal enlargement 25-28 long and 10-12 wide ..... *B. tiliae* Reck
- Femora I and II with 20 and 10 setae; genu I with 8 setae; solenidia on tarsi IV half the length of associated tactile setae; peritremal enlargement 18-20 long and 9-10 wide ..... *B. ulmophila* Reck

12. Fourth pair of dorsocentral setae of female in marginal position 13
- Fourth pair of dorsocentral setae of female in normal position 16

13. Dorsal body setae set on tubercules 14
- Dorsal body setae not on tubercules 15

14. Propodosomal lobes and setae about equal (in length) and set in line; dorsal body setae of female broad spatulate 20-25 long and 11-14; tarsus I with 24 setae; femora with 18 setae ..... *B. siliquae* nov. spec.
- Propodosomal lobes and setae unequal (in length) and in normal position; dorsal body setae of female narrow spatulate 40-70 long and 5-8 wide; tarsus I with 28 setae; femora with 12-15 setae ..... *B. longisetis* Reck

15. Propodosomal lobes and setae about equal in length and set in line; tarsus IV with assosiated setae; true claws of leg I uncinate ..... *B. caricae* nov. spec.
- Propodosomal lobes and setae unequal and in normal position; tarsus IV with duplex setae; true claws of leg I straight ..... *B. convolvulus* Tuttle and Baker

16. Propodosoma with anterior lobes over gnathosoma; dorsal body setae of female slender spatulate set on tubercules; genua 8-5-5-4 or 5 ..... *B. artemisiae* Bagdasarian
- Propodosoma without anterior lobes over gnathosoma; dorsal body setae of female no set on tubercules; genua 8-6-6-6 ..... *B. sarothamni* Geijskes

c. Notes on the species

Bryobia artemisiae Bagdasarian

Bryobia artemisiae Bagdasarian, 1951; Pritchard and Keifer, 1958; Reck, 1959; Livshitz and Mitrofanov, 1971.
Records: U.S.S.R., U.S.A.
Hosts: *Artemisia* sp. (worwood).
New record: Achaia on *Artemisia arborescens* (May 30, 1983) and Kozani on *Artemisia absithium* (September 12, 1987).
Relation to host: This mite lives on the undersurface of the leaf along the leaf veins causing grey spots.

Bryobia attica Hatzinikolis and Emmanouel

Bryobia attica Hatzinikolis and Emmanouel, 1991.
Records: Greece (Attiki)
Host: *Olea europaea* (olive).
Relation to host: This mite was collected on olive bark.

Bryobia kissophila Eyndhoven

Bryobia kissophila Eyndhoven, 1955; Mathys, 1957; Gabele, 1959; Reck, 1959; Livshitz and Mitrofanov, 1966; Livshitz and Mitrofanov, 1971; Gonzalez, 1977; Vacante, 1983.
Records: Europe, U.S.A., U.S.S.R., Chile.
Host: *Hedera helix* (ivy) in Attiki.
New records: This mite was found on ivy throughout continental Greece.
Relation to host: This species is a pest of the ivy and is found all year round on the leaves, where it causes yellow and grey spots resulting in complete yellowing of the leaves. Lower population densities occur during the warm and dry period of the year (summer).

Bryobia cristata (Dugès)

Tetranychus cristata Dugès, 1834.
Bryobia cristata Van Eyndhoven, 1956. Mathys, 1957; Baker and Pritchard, 1969; Manson, 1967; Meyer, 1974.
Bryobia urticae Sayed, 1946.
Records: Europe, Australia, New Zealand, Chile, Egypt, Greece, Japan, South Africa.
Hosts: Grasses, weeds and other herbaceous plants, bromus and avena grasses, *Azalea, Hydranzea macrophylla* (hydranzea), *Polyanthes tuberosum* (polyanthus), *Tradescandia* (spiderwort), *Trifolium* (clover) and occasionally on fruit trees.
New records: Central and Western Macedonia, Thessalia on *Triticum* (wheat), *Hordeum* (barley) and *Medicago sativa* (alfalfa): This mite was found at all stages hibernating in cracks and crevices of walls and tree trunks. High population densities on clover, alfalfa and wheat, cause the foliage to turn yellow and to wilt.

Bryobia convolvulus Tuttle and Baker

Bryobia convolvulus Tuttle and Baker, 1964; Livshitz and Mitrofanov, 1971.
Records: U.S.A., U.S.S.R.
Hosts: *Convolvulus arvensis* (field bind-weed).
New records: Attiki, Korinthos and Chalkidiki on field bind-weed and on *Medicago sativa* (alfalfa) in Boeotia.
Relation to host: On alfalfa this mite was collec-

ted on both leaf surfaces causing yellow or dark spots.

Bryobia longisetis Reck

Bryobia longisetis Reck, 1947; Bagdasarian, 1957; Wainstein, 1960; Livshitz and Mitrofanov, 1971; Chaudri, Akbar and Rasool, 1974.
Records: U.S.S.R., Pakistan, Greece (Boeotia).
Hosts: *Salvia officinalis* (com. sage), *Salvia* (sage).
New records: Phthiotis on *Mentha* sp. (mint) and Thessaloniki on *Cynara scolymus* (artichoke) (September 22, 1977).
Relation to host: This mite has been found in small populations on the ventral surface of leaves. It caused yellow spots and yellowing of the whole leaf, on mint whereas only yellow spots were observed on artichoke leaves.

Bryobia praetiosa Koch

Bryobia praetiosa Koch, 1836; Pritchard and Baker, 1955; Bagdasarian, 1957; Mathys, 1957; Mathys, 1961; Tuttle and Baker, 1968; Livshitz and Mitrofanov, 1971; Meyer, 1974; Chadhri, Akbar and Rasool, 1974; Vacante, 1983; Meyer, 1987.
Records: Cosmopolitan species.
Hosts: Graminae, Phaseoleae, Trifolieae, Viciae, various ornamental flowers and other herbaceous plants.
New records: This mite has been found throughout Greece and in many islands on low grasses, ornamental flowers, various cereals and Papilionaceae.
Relation to host: It is a serious pest of wheat, barley and other grains, lawns, alfalfa, clovers and other herbaceous and flower plants. The initial damage to infested plants of wheat and burley resembles the tunnels of certain leaf miners. Extensive damage to the leaves results in yellow and brown discoloration and eventually complete wilt. In the case of flowering plants folliage and floral injury may also occur.

Bryobia rubrioculus (Scheuten)

Sannio rubrioculus Scheuten, 1857.
Bryobia rubrioculus (Scheuten) Van Eyndhoven, 1956; Baker and Pritchard, 1960; Manson, 1967; Meyer, 1987.
Bryobia arborea Morgan and Anderson, 1957.
Records: Cosmopolitan species.
Hosts: *Pirus* spp., *Prunus* spp. and other deciduous fruit-trees.
New records: This mite is distributed throughout the continental Greece and in many islands on *Pirus, Prunus* and *Juglans regia* (persian walnut).
Relation to host: It is a serious pest of apples, apricot, peach, pear, plum and walnut. It attaks the folliage which becomes whitish grey at first and assumes a pale colour later. On appricot it causes yellow or dark spots to the fruits and heavy infestation results in leaf fall.

Bryobia rubrioculus f. *prunicola* Mathys

Bryobia rubrioculus f. *prunicola,* 1957; Manson, 1967;
Records: Europe, N. Zealand.
Hosts: Exlusively on *Prunus* spp., and occasionally on *Pirus* spp.
New records: This mite is distributed thoughout the continental Greece and in many islands, infested all *Prunus* species, *Eriobotrya japonica* (loquat) and occasionally *Pirus*.
Relations to host: The mite is a serious pest of apricot, cherry, peach, plum *P. insititia* and loquat. It infests the folliage, flowers and fruits of apricot and loquat. Symptoms and damage is similar to that of *B. rubrioculus* and in South Greece it is a serious pest of fruits of apricot but also to loquat. It causes yellow or dark spots and necroses on the fruits, and heavy infestation results in leaf drop on apricot.

Bryobia vasiljevi Reck

Bryobia vasiljevi Reck, 1953.

Bryobia repensi Manson, 1967.
Records: U.S.A., U.S.S.R., Chile, Italy, N. Zealand.
Hosts: *Medicago sativa* (alfalfa), *Trifolium* (clovers), *Vicia sativa* (vetch common), *Melilotus* sp. (melilot), *Solanum gayanum* (natri).
New records: Italy, in Bari region, July 28, 1986, on alfalfa. Greece, Argolis, Attiki, Ilia, Corinthos, Island Crete on *Lathyrus* sp., alfalfa, vetch.
Relation to host: It feeds on the upper leaf surface and causes yellow or dark spots on the leaves.

Bryobia sarothamni Geijkes

Bryobia sarothamni Geijkes, 1939; Reck, 1959.

Bryobia variabilis Manson, 1967.
Records: Europe, U.S.S.R., N. Zealand.
Hosts: *Cutisus sarothamni.*
New records: It was found in the Thessaloniki region, May 22, 1981, on *Medicago arborea* (alfalfa) and in Amfissa region, Phokis, June 30, 1984, on *Rubus* sp. (bramble).

Relation to host: It was found on folliage causing dark spots.

Bryobia tiliae Oudemans

Bryobia tiliae Oudemans, 1928; Bagdasarian, 1957; Livshitz and Mitrofanov, 1971.
Records: Europe, U.S.S.R., Greece (Naoussa).
Hosts: *Tilia* (linden).
New records: Imathia, in Park of Naoussa, August 20, 1988, on linden.
Relation to host: It was found in small populations on both leaf surfaces of linden.

Bryobia ulmophila Reck

Bryobia ulmophila Reck, 1947; Bagdasarian, 1957; Livshitz and Mitrofanov, 1971.
Records: U.S.S.R., Greece (Edessa).
Hosts: *Ulmus* (elm).
New records: Pella, in Park of Edessa, August 21, 1988, on elm and on *Tilia* sp. (linden).
Relation to host: This mite has been found in small populations on the ventral surface of the leaf of elm and linden.

Bryobia watersi Manson

Bryobia watersi Manson, 1967; Livshitz and Mitrofanov, 1970.
Records: Italy, N. Zealand, U.S.S.R.
Hosts: Grass, weeds, *Cucumis sativus* (cucumber), *Malva silvestris* (wallow).
New records: Ilia, June, 18, 1988, on *Arachis hypogaea* (ground nut) and in Marathon Attiki, July 25, 1990 on *Cynodon dactylon* (bermuda grass).
Relation to host: Numerous mites were frequently observed on shoots and on both leaf surfaces causing yellowing and drying of the leaves.

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Αναθεώρηση του Γένους *Bryobia* (Acari: Tetranychidae) στην Ελλάδα

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ΠΕΡΙΛΗΨΗ

Το γένος *Bryobia* από την Ελλάδα αναθεωρείται και δίνεται κλείδα για 16 είδη. Τρία νέα είδη, *B. caricae, B. cerasi* και *B. siliquae* περιγράφονται και σχεδιάζονται (♀ και λάρβα). Τέσσερα είδη, *B. artemisiae* Bagdasarian, *B. convolvulus* Tuttle and Baker, *B. vasiljevi* Reck και *B. watersi* Manson αναφέρονται για πρώτη φορά στην Ελλάδα. Δίνονται πληροφορίες για τους ξενιστές, τη γεωγραφική κατανομή και την οικονομική σημασία κάθε είδους. Μερικοί ξενιστές και συμπτώματα ζημιών αναφέρονται για πρώτη φορά.