The Genus *Brevipalpus* in Greece (Acari: Tenuipalpidae)

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**ABSTRACT**

The genus *Brevipalpus* from Greece is revised and a key to 18 species is provided, with illustrations of the nymphs. Twelve species were formerly recorded: *B. atalanta* (Hatzinikolis), *B. californicus* (Banks), *B. chalcidicus* (Hatzinikolis), *B. hellenicus* (Hatzinikolis and Kolovos), *B. lewisi* McGregor, *B. macedonicus* (Hatzinikolis), *B. obovatus* Donnadieu, *B. oleariae* Baker, *B. olivicola* (Pegazzano and Castagnoli), *B. phoenicis* (Geijskes) and *B. russulus* (Boisduval). The following six species are now recorded for the first time from Greece: *B. cuneatus* (Canestrini and Fanzago), *B. essigi* Baker, *B. ilium* Baker, *B. mallorquensis* Pritchard and Baker, *B. pini* Baker and *B. sayedi* Baker. A review of hosts, distribution and economic importance is presented for each species.

**Introduction**

*Brevipalpus* Donnadieu, 1875 is a large genus of mites which contains a number of species of economic importance which attack a wide range of host plants and have a world-wide distribution. The mites may be recognized by a four-segmented palpus and the absence of dorso-sulateral setae. Nymphs may differ significantly in the shape of the dorsal body setae, which are often of great significance in species determination. The fauna of *Brevipalpus* in Greece is poorly known. Our knowledge on Greek Brevipalpid mites is confined to those species reported from olive trees (Hatzinikolis 1978, 1983, 1985 and Hatzinikolis and Kolovos 1985). Bouchelos et al. (1965) reported *B. phoenicis* from orange trees, later, Hatzinikolis (1970, 1982) reported *B. obovatus* from quince trees, *B. russulus* from *Echinocactus*, and *B. californicus* and *B. lewisi* from citrus.

**Materials and Methods**

The material for this study was collected at the Lykovrys Acarology Laboratory, during the period 1966-85, from plant samples which were received from Agricultural Institutions, local Agricultural Services, individuals, or were collected by the author. Methods of collecting, killing, preservation, clearing, pigmentation, fixing and mounting were described by Hatzinikolis (1982). Most of the samples were collected in eastern mainland Greece, including Macedonia and Thrace, and to a lesser extent in western Greece and the Islands. The great majority of samples were taken from cultivated fruit trees, vegetables, ornamental plants, fodder, grapes and crops cultivated for the food processing industry. A limited number of samples was also taken from cereals, forest trees and various indigenous plants. All the material is deposited in the collection of the Acarology Laboratory of the Agricultural Research Centre, Athens.

**Results**

The present investigation of the genus *Brevipalpus* in Greece deals with the following 18 species: *B. atalanta*, *B. californicus*, *B. chal-
kidicus, B. cuneatus, B. essigi, B. hellenicus, B. lewisi, B. lilium, B. macedonicus, B. malarquensis, B. obovatus, B. oleae, B. olearius, B. olivicola, B. phoenicus, B. pini, B. russulus and B. sayedi. The symptoms induced by these mites are briefly described and their host range is also included under each species. A key based on females and nymphs is provided. Illustrations of nymphs (dorsal view showing setae) to facilitate the separation of the species of Brevipalpus in Greece are given (Figs. 1-18).

**FIG. 1.** B. obovatus, nymph, dorsal view showing setae.

**FIG. 2.** B. phoenicus, nymph, dorsal view showing setae.

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3. Tarsus II with a single sensory rod .......................... 4
   - Tarsus II with two sensory rods.
     Nymphs 3, 4, 5, 6 dorsolateral setae long; 1, 2 small .......................... californicus

4. Rostrum extending beyond distal end of femur 1 .......................... 5
   - Rostrum not extending beyond distal end of femur 1 .......................... 9

5. Rostrum reaching middle of genu I.
   Propodosoma with reticulation mediolaterally, smooth mediadorsally; body setae broadly lanceolate.
   Nymphs 1, 4, 6 dorsolateral setae long; 2, 3, 5 small .......................... olivicola
   - Rostrum reaching distal part of genu I.

6. Rostrum reaching distal end of genu I .......................... 7
   - Rostrum reaching distal end of tibia I.

7. Propodosoma with reticulation but
   - Propodosoma and hysterosoma with pores.
     Nymphs with 1 and 4 dorsolateral setae long; 2, 3, 5, 6 small .......................... atalantae

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**a. Key to species based on females and nymphs**

1. Hysterosoma with five pairs of dorsolaterals .......................... 2
   - Hysterosoma with six pairs of dorsolaterals .......................... 3

2. Tarsus II with a single sensory rod.
   Nymphs 3, 4, 5 dorsolateral setae long; 2 middle; 1 small .......................... obovatus
   - Tarsus II with two sensory rods.
     Nymphs 3, 4, 5 dorsolateral setae long; 1, 2 small .......................... phoenicus
smooth mediodorsally; body setae lanceolate tapering. Nymphs with 4, 6 dorsolateral setae long; 1, 2, 4 small ....................... 
- Propodosoma with reticulation but with areolae posteriorly; body setae lanceolate. Nymphs with 1, 4, 6 dorsolateral setae long; 2, 3, 5 small ........................... macedonicus

8. Hysterosoma with pores; Propodosoma with reticulation elements of different shapes and sizes. Nymphs with fourth dorsolateral seta long; 1, 2, 3, 5, 6 small ....................... hellenicus
- Hysterosoma without pores. Propodosoma with reticulation elements of similar shapes and sizes. Nymphs with 1, 2, 4 dorsolateral setae long; 3, 6 medium; fifth small ....................... chalkidicus

9. Podosoma with anterior medioventrals considerably shorter than posterior pair ........................................ 10
- Podosoma with medioventral setae subequal in length. Nymphs with third dorsolateral seta digellate; 1, 2, 4, 5, 6 small ....................... cuneatus

10. Rostral shield with 4 medium lobes ............................. 11

FIG. 3. B. californicus, nymph, dorsal view showing setae.

FIG. 4. B. olivicola, nymph, dorsal view showing setae.

FIG. 5. B. olearius, nymph, dorsal view showing setae.
b. Notes on the species

*Brevipalpus atalantae* (Hatzinikolis)
**Hystriphilus atalantae** Hatzinikolis, 1978.
**Brevipalpus atalantae** Hatzinikolis, 1986.
Records: Greece (Attiki, Phthiotis, island Evvia).
Host: *Olea europaea* (olive).
New records: Korinthos, Viotia, Rethimno (Crete) on olive trees.
Relation to host: It is found in large populations on buds and leaves of young shoots. It causes damage to the young stems, inflorescences and fruit.

**Brevipalpus californicus** (Banks)

**Tenuipalpus californicus** Banks, 1904.
**Tenuipalpus australis** Tucker, 1926; Womersley, 1941; Lawrence, 1943. Ney synonymy.
**Tenuipalpus vitis** Womersley, 1940. Ney synonymy.
**Brevipalpus confusus** Baker, 1949; André, 1953. Ney synonymy.
**Brevipalpus californicus** McGregor, 1949; Pritchard and Baker, 1952; McGregor, 1956; Pritchard and Baker, 1958; Baker and Pritchard, 1960; Meyer and Rodrigues, 1966; Livshitz and
FIG. 12. *B. sayed*, nymph, dorsal view showing setae.

FIG. 14. *B. lewisi*, nymph, dorsal view showing setae.

FIG. 13. *B. lilium*, nymph, dorsal view showing setae.

Mitrofanov, 1967; Rodrigues, 1968; Wafa, 1968-69; Yousef, 1970; Jeppson et al., 1975. *Hystripalpus californicus* Hatzinikolis, 1982. Records: Asia, Africa, Australia, Middle East, Pacific Islands, Greece, France, Israel, Portugal, Spain, Taiwan, Turkey, U.S.S.R., North, Central and South America, West Indies. Hosts: *Citrus, Cocos, Ficus, Malus, Prunus, Pyrus, Solanum, Thea, Vitis* and a wide variety of ornamental plants. New records: Arta, Crete, Etoloakarnania, Ionian Islands, Peloponnisos, Preveza, Rodos on *Citrus*: *C. limonium* (lemon), *C. media* (citron), *C. nobilis* (mandarin), *C. sinensis* (orange, sweet citrus) and on *Fuchsia, Hydrangea macrophilla, Scindapsus aureus*. Relation to host: It is a serious pest of *Citrus* in Greece, where it causes a silvering of lemon and mandarin fruits and a brown speckling of oranges and sweet oranges. It also causes cellular necroses of the epidermis of *Citrus* fruits. *Brevipalpus chalcidicus* (Hatzinikolis)
Brevipalpus chalkidicus Hatzinikolis, 1986.
Record: Greece (Ormylia Chalkidiki).
Host: Olea europaea (olive).
New records: Cavala, Chalkidiki, Thessaloniki on olive trees.
Relation to host: The mites are found on young shoots.

Brevipalpus cuneatus (Canestrini and Fanzago)

Caligonus cuneatus Canestrini and Fanzago, 1876.
Tenupalpus cuneatus Berlese, 1877; Geijskes, 1939.
Brevipalpus cuneatus Baker, 1949; Livshitz and Mitrofanov, 1967.
Records: Italy, U.S.S.R.
Host: Hedera helix.
New record: Chalkidiki, Stavros 15 September 1977 on Hedera helix.
Relation to host: It is found in small populations on both leaf surfaces.

**Brevipalpus essigi** Baker

*Brevipalpus essigi* Baker, 1949; Pritchard and Baker, 1952.

Records: Mexico, U.S.A.

Hosts: Orchidaceae, Aucuba, Butteja, Ficus, Fuchsia, Howea, Kentia, Pittosporum, Salvia, Veronica.


Relation to host: It is found in small populations on both leaf surfaces.

**Brevipalpus hellenicus** (Hatzinikolis and Kolovos)


*Brevipalpus hellenicus* Hatzinikolis, 1986.

Records: Messinia, Phthiotis.

Host: *Olea europaea* (olive).

New records: Attiki, Viotia on *Olea europaea* and Evvia on *Olea sylvestris*.

Relation to host: It is found on young shoots, buds, leaves and fruits of *O. europaea* causing malformations, spots and drying. It only occurs on young shoots of *O. sylvestris*.

**Brevipalpus lewisi** (McGregor)


*Hystriparpus lewisi* Hatzinikolis, 1982.

Records: Algeria, Australia, Bulgaria, Canada, Egypt, France, Greece, Iran, Israel, Japan, Lebanon, Mexico, Taiwan, Turkey, U.S.A., U.S.S.R.

Hosts: Citrus, Juglans, Punica granatum, Vitis (grape) and over 40 species of ornamental plants.

New records: Attiki, Chalkidiki, Imathia, Kavala, Peloponnisos, Phthiotis, Pieria, Thessaloniki, Thessalia, Viotia on Aphelandra squarosa, Azalea, Begonia radicans, Eriobotrya japonica (loquat), Ficus carica (fig), Juglans regia (pervian walnut), Justicia adhatoda, Morus alba (mulberry), Parthenocissus, Prunus avium (cherry), P. cerasus (sour-cherry), P. persica (peach), Syringa vulgaris, Vitis vinifera (grape).

Relation to host: It is a serious pest of citrus, grapes and pomegranates in Greece. In citrus, damage appears in the form of scablike scars on the skin of fruit. It produces a brownish discoloration, malformations (lines, mesh) and cracking of the skin of the stems of grapes and pomegranate. Mite damage to grapes also gives delayed rise to berry set and eventually causes drying out.

**Brevipalpus lilium** Baker

*Brevipalpus lilium* Baker, 1949; Pritchard and Baker, 1952.


Hosts: Acalypha, Allamanda, Azalea, Cedrela, Croton, Dipladenia, Hibiscus, Ixora, Jasminum, Lagenostoma, Malus, Rhus, Rubus, Sida, Thunbergia, Vitex, Vitis, Lilium.
New records: Rodos 12 August 1975 on Hibiscus, Rethimno (Crete) 18 October 1986 on Jasminium revolutum and Chania (Crete) 17 October 1986 on Ficus carica.
Relation to host: It is found on both leaf surfaces.

Brevipalpus macedonicus (Hatzinikolis)
Hystirpalpus macedonicus Hatzinikolis, 1983.
Brevipalpus macedonicus Hatzinikolis, 1986.
Record: Thessaloniki.
Host: Olea europaea (olive).
New records: Chalkidiki, Thessaloniki.
Relation to host: This mite is found on young shoots, buds, leaves and fruits producing malformations and spots.

Brevipalpus mallorquensis Pritchard and Baker
Brevipalpus mallorquensis Pritchard and Baker, 1958.
Records: Palma, Mallorca, Spain.
Host: Adenostoma sp.
New record: Messinia 5 September 1983 on Rubus.
Relation to host: It is found on both leaf surfaces.

Brevipalpus obovatus Donnadieu
Brevipalpus pereger Donnadieu, 1875; Baker, 1949.
Tenuipalpus bioculatus McGregor, 1914; McGregor, 1916.
Tenuipalpus pseudocuneatus Blanchard, 1940.
Brevipalpus bioculatus Reck 1951.
Hosts: It attacks plants of more than 60 genera of ornamentals, Citrus, Pirus and Cydonia oblonga.
New records: Argolis, Attiki, Corinthos, Evvia, Crete, Phthiotis, Thessalia, Viotia, island Rodos on Camellia japonica, Citrus (lemon, orange), Eriobotrya japonica (loquat), Gossypium (cotton), Hedera helix (ivy), Punica granatum (pomegranate), Lycopersicum esculentum (tomato), Euphorbia pulcherrima, Vitis (grape).
Relation to host: It feeds on the ventral surfaces of the leaves, stems and petioles. It is a serious pest of grapes and citrus in Greece causing yellow or dark spots and necroses on the leaves and fruit. Heavy infestation results in leaf drop.

Brevipalpus oleae Baker
Records: Greece, Italy, Morocco, Portugal, Tunisia.
Host: Olea europaea (olive).
New records: Attiki, Achaia, Chalkidiki, Eto-loakarnania, Evvia, Korinthos, Magnissia, Preveza, Viotia.
Relation to host: It attacks the stems, leaves, inflorescences and fruit of olive trees in Greece.

Brevipalpus olearius Sayed
Brevipalpus olearius Sayed, 1950; Attiah, 1956.
Records: Egypt, Crimea U.S.S.R., Greece, Italy, Libya, Turkey.
Host: Olea europaea (olive).
New records: Chalkidiki, Fokis, Crete, Lakonia, Phthiotis, Rodos, Samos, Skyros, Thessaloniki, Viotia on olive trees.

Brevipalpus olivicola (Pegazzano and Castagnoli)
Hystirpalpus olivicola Pegazzano and Castagnoli, 1972.
Brevipalpus olivicola Hatzinikolis, 1986.
Records: Greece, Italy.
Host: Olea europaea (olive).
New records: Kerkyra, Messinia, Preveza, The-sprotia, Zakynthos on olive trees.
Relation to host: It is found on stems, leaves and small fruits.

Brevipalpus phoenicis (Geijskes)
Tenuipalpus phoenicis Geijskes, 1939.
Brevipalpus phoenicis Sayed, 1946; Baker, 1949; Pritchard and Baker, 1952; De Leon,

Records: Argentina, Australia, Azores, Brazil, Burma, Colombia, Cuba, Dominican Republic, Egypt, Ethiopia, Germany, Greece, France, Hawaii, Netherlands, India, Iran, Italy, Kenya, Lebanon, Madagascar, Malaysia, Mauritius, Mexico, New Zealand, Jamaica, North Africa, Philippines, Portugal, Puerto Rico, Okinawa, Sri Lanka, Sudan, Syria, Taiwan, Tanzania, Thailand, Trinidad, Turkey, U.S.A., U.S.S.R., Venezuela.

Hosts: Citrus, Coffea (coffee), Gossypium (cotton), Gydonia (quince), Ficus, Juglans, Ipomoea (sweet potato), Morus (mulberry), Olea (olive), Phoenix (palm), Prunus, Pyrus, Camellia (tea), Vitis (grape), and some deciduous and subtropical fruits. It also attacks more than 60 genera of ornamental plants.

New records: Ahaia, Arta, Etoholakarnania, Ilia, Ionian Islands, Messinia, Preveza, on Citrus (lemon, mandarin, orange); in Attiki on Begonia sp. and in Ahaia on Gardenia jasminoides and Jasminum sambac.

Relation to host: It is an important pest of citrus in Greece. It infests leaves, twigs, bulbs and fruits. The injured areas become pale and change to a rust brown colour. When infestation is heavy, the leaves become dry and fall.

*Brevipalpus pini* Baker

*Brevipalpus pini* Baker, 1949; Pritchard and Baker, 1952.

Record: U.S.A.

Host: *Pinus*.


*Brevipalpus russulus* (Boisduval)

*Acarus russulus* Boisduval, 1867.

*Tenuipalpus cactorum* Oudemans, 1929; Geijskes, 1939.

*Brevipalpus cactorum* Sayed, 1946; André, 1953.

*Brevipalpus russulus* Oudemans, 1938; Baker, 1949; Pritchard and Baker, 1952; Livshitz and Mitrofanov, 1967.

Records: Argentina, Belgium, Brazil, England, France, Germany, Greece, Japan, Netherlands, Mexico, Peru, U.S.A., (California).

Hosts: Cerus, Chamaecerus, Coryphaenta, Echinocactus, Echinocereus, Ferocactus, Lobivia, Mammillaria, Pilocereus, Mesembryanthemum, Euphorbia.

New records: Attiki on Aporocactus, Echinocactus, Mammillaria, Opuntia, Zygocactus.

Relation to host: Infested plants have a uniform reddish brown colour.

*Brevipalpus sayedi* Baker


Records: U.S.A. (Florida, Indiana, Maryland).

Hosts: Carya illionensis (pecan), C. cordiflorus (hickory), C. ovata (hickory).


Relation to host: This mite has been found on leaf surfaces.

References


**KEY WORDS:** Acari, Tenuipalpidae, Brevipalpus, Brevipalpus in Greece, B. atalantae, B. californicus, B. chalidicus, B. cuneatus, B. essigi, B. helenicus, B. lewisi, B. lilium, B. macedonicus, B. mallorquensis, B. obovatus, B. oleae, B. olearius, B. olivicola, B. phoenicis, B. pini, B. russalus, B. sayedi.
Το Γένος *Brevipalpus* στην Ελλάδα
(*Acari: Tenuipalpidae*)

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