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Notes on tenuipalpid mites associated with *Quercus pubescens* in southern Italy

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Short note

ABSTRACT

During a survey of the flat mites (Tenuipalpidae) on forest trees and agricultural crops in five different sites of the Apulian territories (Southern Italy) in 2019, *Brevipalpus recki* (Livschitz & Mitrofanov) and *Cenopalpus longirostris* (Livschitz and Mitrofanov) were collected on *Quercus pubescens* (Willdenow) (Fagaceae). The authors give an account of the new record of *C. longirostris*, which was not listed in the previous Italian fauna, and of the finding of *B. recki* in southern Italy, since it was only mentioned from the northern region of the country so far. In addition, the paper lists *Q. pubescens* as a new host plant for *C. longirostris*.

Keywords flat mites; new record; survey; Fagaceae

Mites of the family Tenuipalpidae Berlese are specialized plant feeders and the genera *Aegyptobia* (Sayed), *Brevipalpus* (Donnadieu), *Cenopalpus* (Pritchard & Baker) and *Tenuipalpus* (Donnadieu) include 80% of the total number of valid species around the world (Castro *et al.* 2020). The world-wide economic importance of flat mites has been increasing due to the rapid spread of major invasive species and to the association of some of them with the transmission of plant pathogens, mainly viruses (de Lillo *et al.* 2021). Despite their economic significance, the geographic distribution and host associations of the Tenuipalpidae are largely incomplete. Several species of the genus *Brevipalpus* and *Cenopalpus* have been described on oaks (*Quercus* spp.: Fagaceae) around the world: *Cenopalpus abaii* Khosrowshahi & Arbabi, *C. lanceolatisetae* Attiah, *C. meyerae* Khosrowshahi, *C. quercusi* Khanjani *et al.*, *Brevipalpus albus* De Leon, *B. alni* De Leon, *B. arizonicae* Baker & Tuttle, *B. encinarius* De Leon, *B. glomeratus* Pritchard & Baker, *B. insinuates* De Leon, *B. linki* Baker, *B. mitrofanovi* Pegazzano, *B. moreliensis* Baker & Tuttle, *B. oaxacensis* De Leon, *B. ogmus* Pritchard & Baker, *B. pseudopini* (Baker & Tuttle), *B. quercicolus* De Leon, *B. querensis* Baker & Tuttle, *B. recki* Livschitz & Mitrofanov and *B. rugosus* De Leon (Baker 1949; Pritchard and Baker 1952, 1958; De Leon 1960, 1961; Livshitz and Mitrofanov 1967; Thewke and Enns 1970; Pegazzano 1975; Meyer and Gerson 1980; Baker and Tuttle 1987; Hatzinikolis and Emmanouel 1987; Papaioannou-Souliotis *et al.* 1994; Khosrowshahi and Arbabi 1997; Sağlam and Çobanoğlu 2010; Khanjani *et al.* 2012; Ardali *et al.* 2014). Despite the above-mentioned list of species recorded on oaks, only two species *B. mitrofanovi* and *B. recki* have been found in Italy (Bernini *et al.* 1995). The aim of this study was to improve knowledge about tenuipalpid species found on *Quercus* species in Italy, updating Pegazzano (1975). Based on the current study, *C. longirostris* (Figure 1) is a newly recorded species from Italy and *B. recki* is spread also in the south of Italy.

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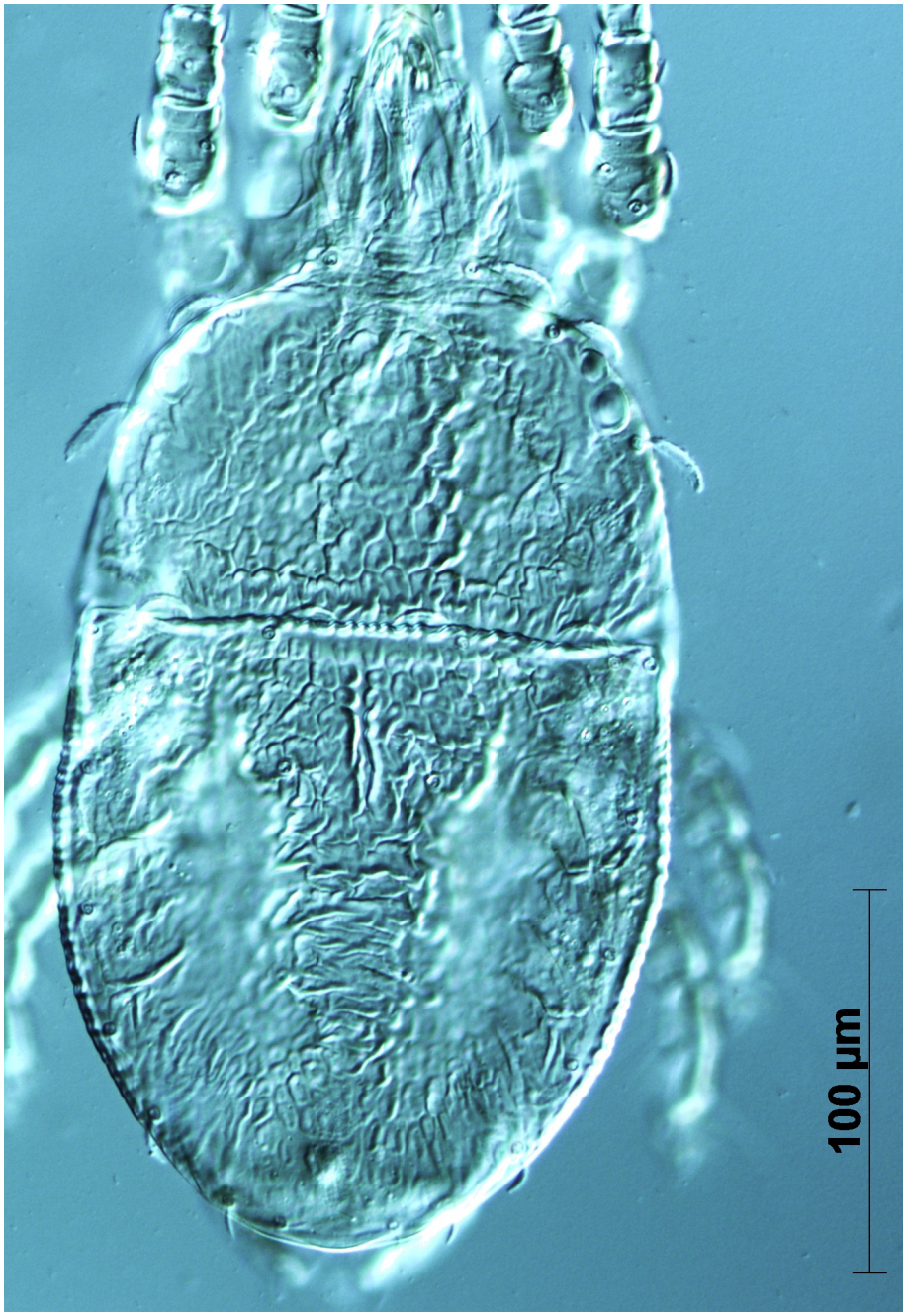

Figure 1 Light micrograph (DIC) of *Cenopalpus longirostris*, adult female.

Leaves and twigs of twenty plants belonging to the genus *Quercus* (*Q. coccifera* L., *Q. ilex* Lour., *Q. pubescens* Will., *Q. robur* L., *Q.* sp. and *Q. suber* L.) (Table 1) were sampled between September and October 2019 in five locations of the Apulia District (Southern Italy): Bari (crop area), Mercadante Forest (Alta Murgia National Park – crop and natural areas), Cassano delle Murge (natural area), Bitetto (natural area) and Mattinata (natural area) (Figure 2). Plant samples were kept in polyethylene bags containing a paper towel, stored in a refrigerator (at about +4°C) and analyzed using Olympus SZH10 stereomicroscope at the Department of Soil, Plant and Food Sciences (DiSSPA), University of Bari Aldo Moro. Mites were slide-mounted in Hoyer's mounting medium (Walter and Krantz 2009) and dried in an oven (40-50 °C)

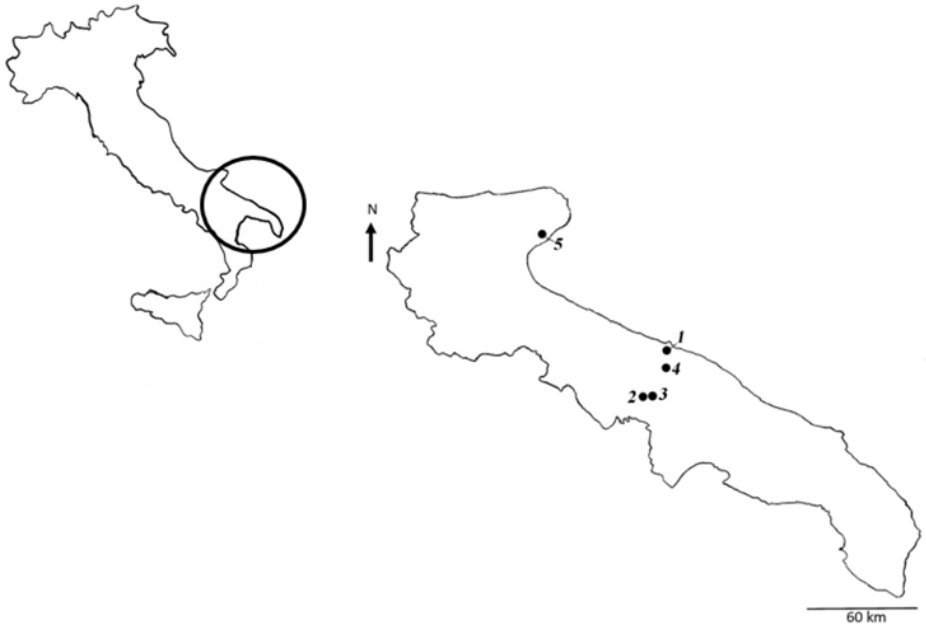

Figure 2 Map of Apulian District showing the locations inspected for *Brevipalpus recki* and *Cenopalpus longirostris*. **Negative sites**: 1 (Bari), 3 (Cassano delle Murge - Alta Murgia National Park) and 5 (Mattinata). **Positive sites**: 2 (Mercadante Forest - Alta Murgia National Park) and 4 (Bitetto).

for one week. Mites were identified based on the original descriptions and illustrations by Livschitz and Mitrofanov (1967); the identification of the plant hosts follows Fiori (1969). The specimens were studied using Differential Interference Contrast (DIC) and Phase Contrast microscopy. Voucher specimens were deposited in the Entomological and Zoological Section, Department of Soil, Plant and Food Sciences (DiSSPA), University of Bari Aldo Moro, Italy (UNIBA); two slides of *C. longirostris* (1 deutonymph and 1♀) are deposited also in the United States National Insect and Mite Collection Smithsonian Institution, located at the Systematic Entomology Laboratory (SEL), USDA, Beltsville, Maryland, USA (USNM).

Brevipalpus recki and *C. longirostris* have been previously recorded on various host plant families: *B. recki* on Asteraceae (*Inula vulgaris* Trevis.), Fagaceae (*Q. alba* L., *Q. cerris* L., *Q. ithaburensis* Decne., *Quercus* sp.) and Rosaceae (*Cerasus avium* (L.) Moench, *Rubus* sp.); *C. longirostris* was reported on Fagaceae (*Quercus* sp.) (Papaioannou-Souliotis *et al.* 1994) and Rosaceae (*Pyrus communis* L.) (Livschitz and Mitrofanov 1967). However, *B. recki* and *C. longirostris* were collected together on *Q. pubescens* in three out of twenty samples inspected from the Mercadante Forest (Alta Murgia National Park) and Bitetto, located in southern Italy. Previously 27 species of flat mites were listed for Italy (De Giosa *et al.* 2021) and with the finding of *C. longirostris*, the total number of tenuipalpid mites in Italy increased to 28 species.

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Table 1 Species belonging to the *Quercus* genus, collected in five Apulian territories.

Sample's number	Locality	Coordinates	Host species
1	Bari	41° 06'35.0''N 16° 52'55.0''E	*Quercus ilex*
2	Mercadante Forest (Alta Murgia National Park)	41°06'39.0''N 16°52'57.0''E	*Quercus* sp.
		41°06'43.0''N 16°52'55.0''E	*Quercus pubescens*
		41°6'43.0''N 16°52'55.0''E	*Quercus suber*
		40°53'06.0''N 16°39'11.0''E	*Quercus ilex*
		40°53'15.0''N 16°41'25.0''E	*Quercus robur*
		41°01'30.0''N 16°23'57.0''E	*Quercus pubescens*
3	Cassano delle Murge (Alta Murgia National Park)	40°52'26.0''N 16°41'50.0''E	*Quercus robur*
		41°02'26.0''N 16°41'40.0''E	*Quercus coccifera*
4	Bitetto	41°02'53.0''N 16°42'36.0''E	*Quercus* sp.
		41°02'27.0''N 16°44'12.0''E	*Quercus pubescens*
5	Mattinata	41°43'01.0''N 16°04'36.0''E	*Quercus ilex*

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References

Ardali M.-R., Hadizadeh A., Sharif M.-M., Khanjani M., Attiah H.-H. 2014. Tenuipalpid mites from Northern Iran and description of the male of *Cenopalpus rubusi* Khanjani 2012. Acarologia, 54(4): 453-462. https://doi.org/10.1051/acarologia/20142140

Baker E.-W. 1949. The genus *Brevipalpus* (Acarina: *Pseudoleptidae).* The American Midland Naturalist, 42(2): 350-402. https://doi.org/10.2307/2422013

Baker E.-W., Tuttle D.-M. 1987. The false spider mites of Mexico. United States Department of Agriculture, Agricultural Research Service, Technical Bulletin, 1706: 1-237.

Bernini F., Castagnoli M., Nannelli R. 1995. Arachnida, Acari. In: Minelli A., Ruffo S., La Posta S. (eds.), Checklist delle specie della fauna italiana, 24. Edizione Calderini, Bologna, pp. 1-131.

Castro E.B., Mesa N.C., Feres R.J.F., Moraes de G.J., Ochoa R., Beard J.J., Demite P.R. 2020. A newly available database of an important family of phytophagous mites: Tenuipapidae Database. Zootaxa, 4868(4): 577-583. https://doi.org/10.11646/zootaxa.4868.4.7

De Giosa M., Bassini-Silva R., de Lillo E., McDonald E.M., Ochoa R. 2021. Italian Acarine species intercepted in the United States. International Journal of Acarology, 47(8): 689-694. https://doi.org/10.1080/01647954.2021.1990407

De Leon D. 1960. The genus *Brevipalpus* in Mexico, Part I (Acarina: Tenuipalpidae). Florida Entomologist, 43(4): 175-187. https://doi.org/10.2307/3492784

De Leon D. 1961. The genus *Brevipalpus* in Mexico, Part II (Acarina: Tenuipalpidae). Florida Entomologist, 44(1): 41-52. https://doi.org/10.2307/3492547

de Lillo E., Freitas-Astúa J., Kitajima E.W., Ramos-González P.L., Simoni S., Tassi A.D., Valenzano D. 2021. Phytophagous mites transmitting plant viruses: update and perspectives. Entomologia generalis, 41(5): 439-462. https://doi.org/10.1127/entomologia/2021/1283

Fiori A. 1969. Nuova flora analitica d'italia. Edagricole, Vol 1.

Hatzinikolis E.-N., Emmanouel N.-G. 1987. A revision of genus *Cenopalpus* in Greece (Acarina: Tenuipalpidae). Entomologia Hellenica, 5(1): 13-26. https://doi.org/10.12681/eh.13943

Khanjani M., Khanjani M., Saboori A., Seeman O.-D. 2012. The false spider mites of the genera *Cenopalpus* Pritchard & Baker (Acari:Tenuipalpidae) from Iran. Zootaxa, 3433: 1-59. https://doi.org/10.11646/zootaxa.3433.1.1

Khosrowshahi M., Arbabi M. 1997. The Tenuipalpidae (Acari) of Iran with introduction of new species for the world fauna and Iran. Ministry of Agriculture, Agriculture research, Education and Extension Organization Plant Pests and Diseases Research Institute, Tehran, 1-19.

Livschitz I.-Z., Mitrofanov V.-I. 1967. Materials to the cognition of the Acariformes: Tenuipalpidaes fauna. Proceedings Nikitsky Botanic Garden 39: 1-72 [in Russian].

Meyer M.-K.-P., Gerson U. 1980. Some false spider mites (Prostigmata: Tenuipalpidae) from Israel. Israel J. Ent., 15: 67-81.

Papaioannou-Souliotis P., Ragusa di Chiara S., Tsolakis C. 1994. Phytophagous mites and their predators observed on cultivated plants in Greece during 1975-1990. Annals Istitute Phytopathological Benaki, 35-87.

Pegazzano F. 1975. Due acari Tenuipalpidi infeudati al gen. *Quercus*: *Tauripalpus recki* (Livsh and Mitrof.) nuovo per l'Italia e *Tauripalpoides mitorfanovi* gen. nov., sp. nov. Redia, 56: 543-553.

Pritchard A.E., Baker E.-W. 1952. The false spider mites of California (Acarina: *Phytoptipalpidae)*. University of California Publications in Entomology, 9(1): 1-94.

Pritchard A.E., Baker E.W. 1958. The false spider mites (Acarina: Tenuipalpidae). University of California Publications in Entomology, 14(3): 175-274.

Sağlam H.D., Çobanoğlu S. 2010. Determination of Tenuipalpidae (Acari: Prostigmata) species in parks and ornamental plants of Ankara, Turkey. Turkish Journal of Entomology, 34(1): 37-52.

Thewke S.E., Enns W.-R. 1970. The spider-mite complex (Acarina: Tetranychoidea) in Missouri. University of Missouri, Missouri Agricultural Experimental Station, Contribution No. 5969, and No. 7294, Entomology Research Division, USDA, pp. 1-106.

Walter D.E., Krantz G.-W. 2009. Collection, rearing, and preparing specimens. In: Krantz, G.W. & Walter, D.E. (Eds.), A Manual of Acarology, Third Edition. Texas Tech University Press, Lubbock, Texas, pp. 83-96.