NOTES ON PHYTOSEIID MITES IN SICILY WITH A DESCRIPTION OF A NEW SPECIES OF *TYPHLODROMUS* (ACARINA : MESOSTIGMATA)

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ABSTRACT

During 1972-74 sixteen species of phytoseiid mites were collected on various plants in Sicily. *Typhlodromus exhilaratus* n. sp. is described.

RÉSUMÉ

Pendant les années 1972-74 on a recueilli seize espèces d'acariens phytoseiides sur différentes plantes en Sicile. On donne la description de *Typhlodromus exhilaratus* n. sp.

INTRODUCTION

During the last few years phytoseiid mites have been considered with great interest because they are predators of both phytophagous mites and various insects, so that they could be used in a program of integrated control. It would therefore be worthwhile to study their phenology and to obtain information on the distribution of these predators in the fields.

Apart from Berlese's studies, little is known in Italy about these mites. In Sicily LOMBARDINI (1959) determined *Amblyseius tardi* (= *Phytoseiulus persimilis*), which was found on *Citrus* sp. and sent to him from Palermo. During 1972-74 we carried out a first survey of phytoseiid mites living either on fruit trees or on ornamental plants, usually unsprayed.

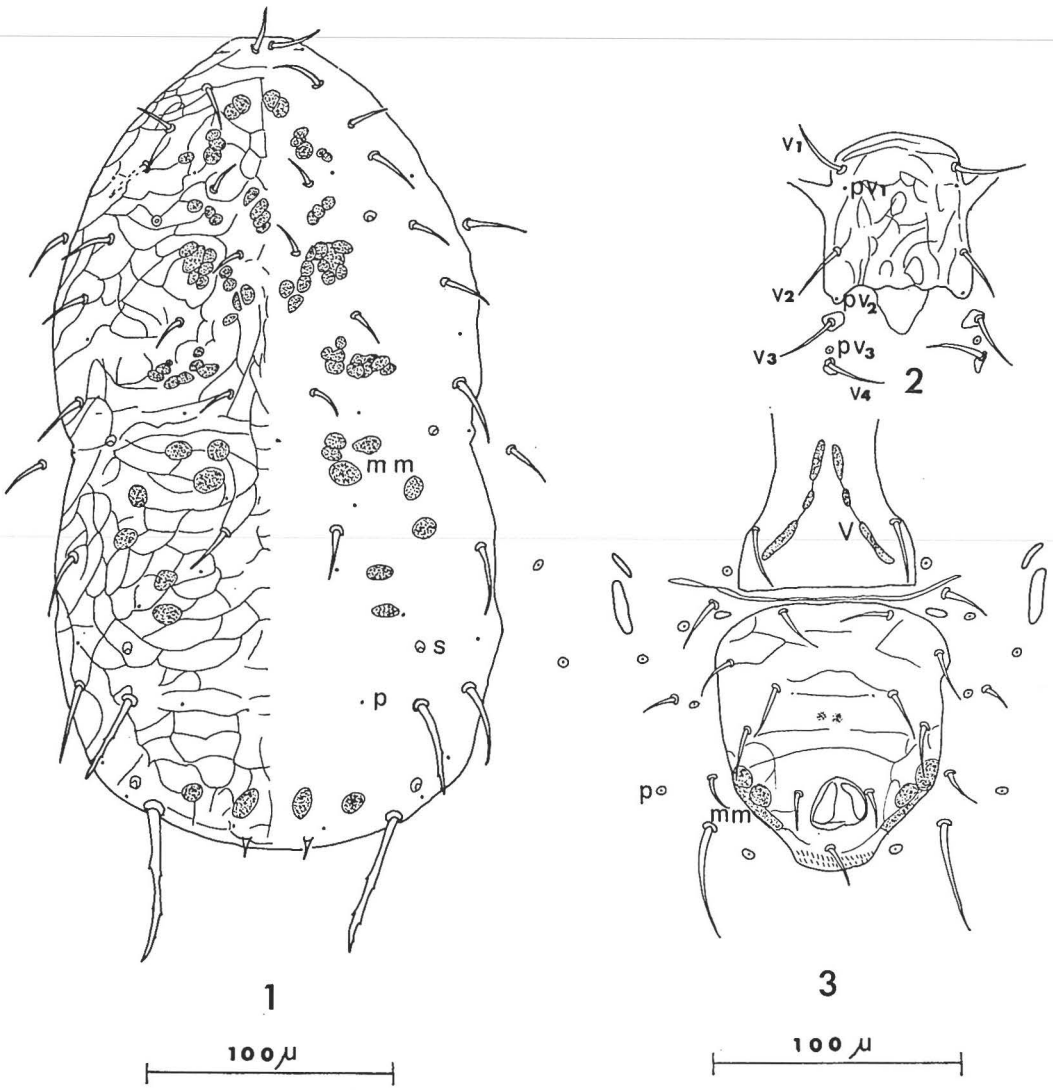
The collection was made in the following localities : Palermo, Scillato (50 km from Palermo) about 250 m above sea-level, Polizzi Generosa (80 km from Palermo) about 600 m above sea-level, Monreale (10 km from Palermo), Mondello (10 km from Palermo), Carini (20 km from Palermo), Cefalù (100 km from Palermo), Ucria (70 km from Messina) about 700 m above sea-level.

Mites were stored in 70 % alcohol, cleared in Nesbitt's solution (chloral hydrate, hydrochloric acid and water, 8 : 0.5 : 5) and mounted in Hoyer's fluid. We followed the setal terminology of GARMAN (1948) and NESBITT (1951), and the Sigillotaxie, Adenotaxie and Poroidotaxie of ATHIAS-HENRIOT (1975) was adopted.

Typhlodromus exhilaratus n. sp.

FEMALE (25 females) (Figs. 1-3, 7a, 7b). Dorsal shield (Fig. 1) sclerotised, suboval, with lateral margins constricted, bearing a slight protuberance in the middle of the waist ; lateral part of the dorsal shield, besides the smooth area between the setae L_8-D_6, is covered with cells (mostly elongate ones) ; a number of elongate narrow cells is present between D_3-D_4 ; the remaining parts of the shield are covered with irregular cells, in some specimens those on the posterior part being slightly prominent ; the cells at the level and around setae D_5 are strongly accentuated.

Four pairs of solenostomes are distributed as follows on the dorsal shield : postero-mesad



FIGS. 1-3 : **Typhlodromus exhilaratus** n. sp., female.

1) dorsal shield. mm-muscle marks (Sigillotaxie) ; p-poroides ; s-solenostomes (Adenotaxie) ; 2) sternal shield and metasternal plates ; 3) genital shield, ventrianal shield and metapodal plates. mm-muscle marks ; p-poroides ; pv1-pv3-sternal and metasternal poroides ; v1-v4-setae ; V-V-line (muscle marks).

to D_2-L_4, posterior to L_6, anterior to M_2 and antero-laterally to L_9. 14 pairs of visible poroides and muscle marks (Sigillotaxie) are marked in Fig. 1. Dorsal shield carries 17 pairs of setae : 6D, 2M, 9L ; setae M_2 and L_9 are slightly serrated.

Anterior margin of the sternal shield convex, the posterior one irregularly waved and lobed (fig. 2) ; in some specimens the lobe is placed posterior to the sternal shield (? artifact) ; few prominent striae near its anterior border, other parts being weakly striated, sometimes the striae passing into a slight reticulation ; the shield carries two pairs of setae and prominent poroides pv1 and pv2 ; setae v3 situated on platelets ; setae v4 placed on subtriangular metasternal plates ; poroides pv3 are situated either on the latter or anterior to them (on the membrane). Genital shield (Fig. 3) very slightly striated ; its posterior margin straight ; muscle marks (V-line) prominent. Ventrianal shield (Fig. 3) subpentagonal ; its anterior margin rounded ; bearing four pairs of preanal setae ; it is slightly striated to a more or lesser degree, with few irregular cells and with prominent muscle marks ; a pair of minute solenostomes (ian-pores) is present, unvisible in some specimens ; ratio of length/width = 1.14 (1.03-1.34). A slender platelet is situated between the genital and ventrianal shields ; a pair of minute bacillus-like platelets is present antero-laterally to the latter. Four pairs of setae surround the ventrianal shield and seven pairs of poroides are visible on the ventral interscutal membrane. Primary and secondary metapodal plates sublinear (Fig. 3). Apex of peritreme usually reaches L_1, sometimes L_1-D_1 or L_1-L_2.

In the insemination apparatus (Figs. 7a, 7b) the calyx is campanuliform, thickwalled allover ; a neck is present ; major duct cylindrical ; minor duct distinct.

Hind leg carries a slightly knobbed macroseta, not reaching the dorsal lyriform fissure. Solenostomes on the anterior coxae present.

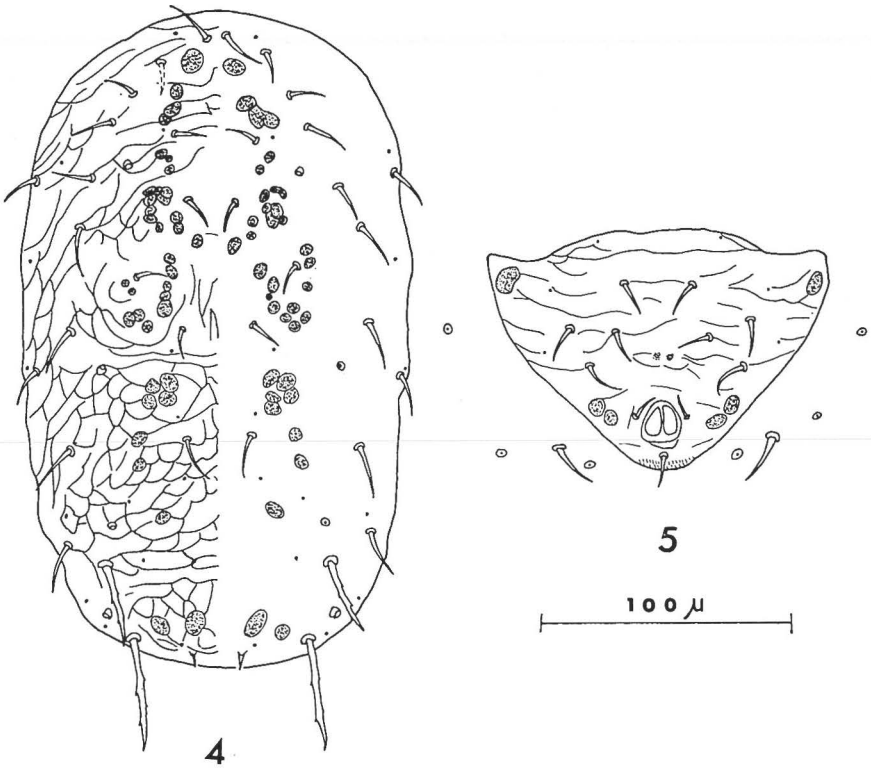
Fixed digit of the chelicerae has two or three teeth and the *pilus dentilis* and the movable one unidentate.

Measurements (in microns) : Dorsal shield = 321 (300-336) ; Lva = 107 (101-111) ; lva = 92 (71-101) ; primary metapodal plate = 26 (21-33) ; D_1 = 20 (17-23) ; D_2, D_3 = 13 (11-14) ; D_4 = 15 (13-17) ; D_5 = 19 (17-20) ; L_1 = 21 (17-24) ; L_2 = 15 (11-17) ; L_3 = 19 (17-21) ; L_4 = 17 (14-20) ; L_5 = 24 (21-26) ; L_6 = 26 (23-28) ; L_7 = 28 (26-30) ; L_8 = 30 (28-34) ; L_9 = 58 (53-60) ; M_1 = 14 (13-15) ; M_2 = 38 (35-41) ; S_1 = 22 (20-24) ; S_2 = 21 (19-23) ; VL_1 = 47 (43-53) ; St = 35 (32-38).

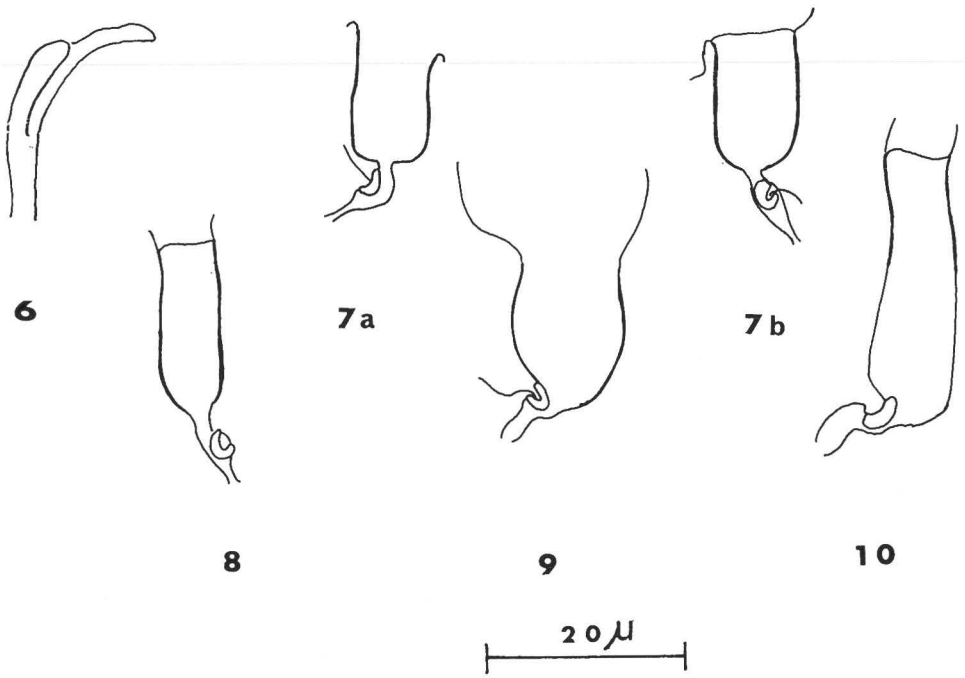
Male (one male) (Figs. 4-6). Dorsal shield (Fig. 4) reticulated as in female, the reticulation being accentuated on its posterior part ; it carries 19 pairs of setae and four pairs of solenostomes (see female) ; 14 pairs of visible poroides and muscle marks were marked in Fig. 4. The genitosternal shield normal, carrying two pairs of visible poroides. Ventrianal shield (Fig. 5) subtriangular, weakly striated allover ; it bears four pairs of preanal setae, three pairs of prominent poroides and muscle marks ; solenostomes not visible in the single specimen. Three pairs of poroides are present on the interscutal membrane. Peritremal shield not fused with the ventrianal one. Apex of peritreme reaches L_1-L_2.

The structure of the spermatodactyl is given in Fig. 6. Hind leg carries a macroseta on the basitarsus.

Measurements (in microns) : Dorsal shield = 260 ; Lva = 95 ; lva = 135 ; D_1 = 19 ; D_2 = 9 ; D_3, D_4, M_1 = 11 ; D_5, L_3, L_4 = 15 ; L_2 = 13 ; L_5, L_6, L_8 = 20 ; L_7 = 21 ; L_9 = 44 ; M_2 = 32 ; S_1, S_2 = 16 ; VL_1 = 20.



FIGS. 4-5 : **Typhlodromus exhilaratus** n. sp., male.
4) dorsal shield ; 5) ventrianal shield.



FIGS. 6-10 : Spermatodactyl (6) and spermathecae (7-10).
6, 7a,b) **Typhlodromus exhilaratus** n. sp. ; 8) *T. tiliae* Oud. ;
9) *T. phialatus* Athias-Henriot ; 10) *T. athiasae* Porath and Swirski.

Relation to other species. *Typhlodromus exhilaratus* n. sp. belongs to the *T. tiliae* Oudemans group. It closely resembles *T. phialatus* Athias-Henriot (1960 a) from which it differs in the shape of the insemination apparatus : the small prominent neck of *T. exhilaratus* (Fig. 7) is absent in the latter (Fig. 9).

T. exhilaratus can be easily distinguished from *T. tiliae* Oudemans, *T. rodovae* Wainstein and Arutunian (1968), *T. tubifer* Wainstein (1961), *T. corticis* Herbert (1958) by the following characters : 1) number of solenostomes on the dorsal shield (four in *T. exhilaratus*, three in *T. tiliae* and *T. tubifer*, five in *T. rodovae* and *T. corticis*) ; 2) neck of the insemination apparatus (a small one in *T. exhilaratus*, a long one in *T. tiliae* (Fig. 8) and *T. tubifer*, absent in *T. rodovae*) ; 3) teeth on the movable digit of the chelicera (two in *T. tiliae*, one in *T. exhilaratus*).

The following species have four pairs of solenostomes on the dorsal shield : *T. cotoneastri* Wainstein (1961), *T. perbibus* Wainstein and Arutunian (1968), *T. athiasae* Porath and Swirski (1965), *T. tiliae* Oudemans, sensu Abbasova (1970), *T. pellargonicus* Elbadry 1968 (from Elbadry, 1970) and *T. siwa* Elbadry (1967). The first five species differ from *T. exhilaratus* by the shape of the insemination apparatus (the neck being absent (Fig. 10) or long), by the macroseta on the hind leg (three in *T. perbibus* and *T. pellargonicus*, a long one passing the dorsal lyriform fissure in *T. cotoneastri*, not knobbed ones in *T. athiasae* and *T. tiliae*). The calyx and the atrium of *T. siwa* are much longer than those of *T. exhilaratus*.

T. exhilaratus differs from the African species *T. magdalenae* Pritchard and Baker (1962) (also from Van der Merwe, 1968) and *T. griekwensis* Schultz (1973) by the shape of the insemination apparatus (absence of a neck in both species), by the number of teeth on the movable digit (three in the African species, one in *T. exhilaratus*) and by the number of setae on the sternal shield (two pairs in *T. exhilaratus*, three pairs in the others).

Type locality and habitat : Holotype female (No. S27A(1)) and twelve paratype females were collected on *Rosmarinus officinalis*, on Feb. 9, 1973, at Scillato. Allotype male (No. S77A) on *Laurus nobilis*, on March 16, 1974, at Palermo (Botanical Gardens).

Other paratypes :

Compositae : On *Santolina rosmarinifolia* (leaves) : Palermo (Botanical Gardens), March 16, 1974, two females.

Lauraceae : On *Laurus nobilis* (leaves) : Palermo (Botanical Gardens), March, 16, 1974, four females.

Rutaceae : On *Citrus aurantium* (leaf, lower side) : Scillato, Feb. 9, 1973, three females. On *Citrus limonum* (leaves) : Carini, July 21, 1973, five females ; Bagheria, Oct. 13, 1973, one female.

Vitaceae : On *Vitis vinifera* (leaves, lower side) : Scillato, May 29, 1973, three females.

Location of types : In the Istituto di Entomologia Agraria dell'Università di Palermo, Italia.

Amblyseius aberrans (Oudemans), 1930

Type locality and habitat : On *Tilia platyphyllos*, Arnhem, the Netherlands. The holotype of this species is a nymph (Nesbitt, 1951). Found also in England, Canada, U.S.A. (Chant, 1959), Switzerland, North Italy (Mathys, 1956 from Schruft, 1967), Germany (Westerboer

and BERNHARD, 1963), Poland (BOCZEK and KROPCSZYNSKA, 1964), Hungary (KROPCZYNSKA and JENSER, 1968), Crimea (LIVSHITZ and KUZNETSOV, 1972), Turkey (DÜZGÜNES, 1963 from EHARA, 1966), Israel (SWIRSKI and AMITAI, 1965), Algeria (ATHIAS-HENRIOT, 1958).

Location of types : Holotype in the Rijksmuseum van Natuurlijke Historie, Leiden, (CHANT, 1959).

Records :

Annonaceae : On *Annona cherimolia* (leaf) : Palermo, (Botanical Gardens), March 3, 1974, 1 female.

Betulaceae : On *Corylus avellana* (leaves, stem and buds infested by *Eriophyes avellanae*) : Polizzi, June 6, 1973, 5 females ; June 14, 1973, 33 females, 4 males ; Ucria, June 15, 1973, 8 females, 1 male.

Borraginaceae : On *Bourreria succulenta* (leaves) : Palermo (Botanical Gardens), March 22, 1974, 1 female.

Caprifoliaceae : On *Viburnum* sp. (leaves) : Palermo, March 3, 1974, 11 females.

Fagaceae : On *Quercus* sp. (leaves) : Scillato, Aug. 19, 1972, 2 females ; Feb. 9, 1973, 17 females.

Lauraceae : On *Persea gratissima* (leaf) : Palermo (Botanical Gardens), March 16, 1973, 1 female.

Rosaceae : On *Eriobotrya japonica* (leaves) : Palermo, July 12, 1973, 2 females ; Scillato, Feb. 9, 1973, 2 females ; Monreale, Oct. 24, 1974, 1 female. On *Prunus domestica* (leaves) : Polizzi, June 4, 1973, 3 females.

Note : It is worthwhile to present biometric data (Table I) on *A. aberrans* from Sicily in comparison with mites from the Netherlands and Germany.

TABLE I

Biometric data on *Amblyseius aberrans* (Oud.), Females
(Measurements in μ)

	Sicily (a) 25 females	Sicily (b) 11 females	Netherlands (c) 6 females	Germany (d) females
D_1	12.5–21	12.5–21	16–21	21
D_5	19.5–37.5	19.5–37.5	24.5–34.5	21
L_1	28.5–40.7	28.5–40	31–42	27
L_6	40.5–60	34.5–41	39–57	45
L_8	46.5–61.5	46.5–61.5	45.5–60	48
M_2	37.5–55.7	37.5–55.7	39–57	41

(a) On *Corylus avellana* at Polizzi Generosa, June 1973.
(b) On *Viburnum* sp. at Palermo, March 1974.
(c) On *Pyrus malus* at Goes (Zealand Province), June 1958 ; July 1960.
(d) From Westerboer and Bernhard, 1963.

Amblyseius barkeri (Hughes), 1948

Type locality and habitat : Germinating barley plumules, London Docks, England (CHANT, 1959). This species was recorded from Europe, Northern and Equatorial Africa, California (ATHIAS-HENRIOT, 1966), Israel (PORATH and SWIRSKI, 1965), Japan (EHARA, 1972) and Italy.

Location of types : Holotype in the British Museum (Natural History) (?) (CHANT, 1959).

Records :

Rosaceae : On *Fragaria* sp. (leaf) : Palermo, Feb. 8, 1974, 1 female.

Amblyseius cucumeris (Oudemans), 1930

Type locality and habitat : On *Cucumis melo*, Buré, France (CHANT, 1959). Found also in Switzerland, Germany, Holland, England, Egypt, Canada, U.S.A., New Zealand, Mexico and Australia (CHANT, 1959), Crimea (LIVSHITZ and KUZNETSOV, 1972), Poland (WIACKOWSKI and SUSKI, 1963), Algeria (ATHIAS-HENRIOT, 1966), Israel (WYSOKI and SWIRSKI, 1971), India (SADANA and KANTA, 1971) and Italy.

Location of types : Holotype, in the Rijksmuseum van Natuurlijke Histoire, Leiden (CHANT, 1959).

Records :

Compositae : On *Santolina rosmarinifolia* (leaves) : Palermo (Botanical Gardens), March 16, 1974, 6 females.

Cyperaceae : On *Papyrus* sp. (leaves) : Scillato, Feb. 9, 1973, 3 females.

Amblyseius aff. *engaddensis* Amitai and Swirski, 1970

Type locality and habitat : Holotype female, a paratype and an allotype of *Amblyseius engaddensis* A. and S. were collected from undetermined Gramineae at'En Gedi (AMITAI and SWIRSKI, 1970).

Location of types : In the collection of the Division of Entomology at the Agricultural Research Organization, Bet-Dagan, Israel (AMITAI and SWIRSKI, 1970).

Record :

Oleaceae : On *Jasminum odorosissimum* (leaf) : Scillato, May 29, 1973, 1 female.

Notes : The Italian specimen closely resembles *Amblyseius engaddensis* Amitai and Swirski. Examination of the slide paratype shows that the arrangement of setae, the ventrianal shield, the solenostomes and the structure of the insemination apparatus are very similar.

As *Amblyseius engaddensis* Amitai and Swirski was found in Israel only in one region around the Dead-Sea and, as only one specimen was collected in Sicily, more specimens should be collected before a final decision can be reached. Therefore at this stage it is called *Amblyseius* affinis *engaddensis*.

Measurements of setae (in microns) : $D_1 = 17$; $D_2 = 13$; D_4, $D_5 = 14$; $L_1 = 21$; L_2, L_3, $L_5 = 15$; $L_4 = 20$; $L_6 = 21$; $L_7 = 24$; $L_8 = 28$; $L_9 = 67$; $M_1 = 11$; $M_2 = 26$.

Amblyseius messor (Wainstein), 1960

Type locality and habitat : On Gramineae, Georgia (U.S.S.R.), June 1953 ; May 1955, females (WAINSTEIN, 1960). Found also in Crimea (LIVSHITZ and KUZNETSOV, 1972), in Israel (SWIRSKI and AMITAI, 1965), Algeria, Spain, South Africa (ATHIAS-HENRIOT, 1966) and Sicily. Allotype male was found on *Solanum nigrum*, at Nahal Polegh (Israel), on Feb. 19, 1970 (AMITAI and WYSOKI, 1974).

Location of types : Holotype and paratype females in Dr. B. A. Wainstein's collection (Reservoir Biology Institute, U.S.S.R. Academy of Sciences, Borok, Nekouz, Yaroslavl) (WAINSTEIN,

1960). Allotype in the Division of Entomology at the Agricultural Research Organization, Bet Dagan, Israel (AMITAI and WYSOKI, 1974).

Record :

Rutaceae : On *Citrus limonum* (leaf, lower side) : Carini, July 21, 1972, 2 females.

Amblyseius stipulatus Athias-Henriot, 1960

Type locality and habitat : Syntypes 10 females, one male were found on *Citrus* sp., Apr., 1959 at Morris (Algeria) (ATHIAS-HENRIOT, 1960 *b*). Found also in Greece (SWIRSKI, personal communication), and Italy.

Location of types : Syntypes in the Laboratoire d'Acarologie de l'École Pratique des Hautes Études, Paris (ATHIAS-HENRIOT, 1960 *b*).

Records :

Borraginaceae : On *Bourreria succulenta* (leaf) : Palermo (Botanical Gardens), March 22, 1972, 1 female.

Caprifoliaceae : On *Viburnum* sp. (leaves) : Palermo, March 22, 1973, 2 females ; March 6, 1974, 10 females.

Celastraceae : On *Evonymus* sp. (leaf) : Scillato, March 16, 1973, 1 female.

Euphorbiaceae : On *Ricinus communis* (leaves and stem) : Palermo, Jan. 9, 1972, 5 females ; March 9, 1974, 1 female, 1 male.

Lauraceae : On *Laurus nobilis* (leaves) : Palermo, March 16, 1974, 1 female ; April 5, 1974, 1 female.

Malvaceae : On *Hibiscus rosasinensis* (leaves) : Palermo, March 11, 1974, 2 females.

Oleaceae : On *Jasminum odorosissimum* (leaves) : Scillato, May 29, 1973, 3 females, 1 male.

Pittosporaceae : On *Pittosporum tobira* (leaves) : Palermo, March 15, 1974, 2 females.

Rosaceae : On *Prunus domestica* (leaves) : Monreale, Oct. 24, 1974, 2 females.

Rutaceae : On *Citrus aurantium* (on the lower side of leaves, principally under spider webs and fruit calyces) : Scillato, Aug. 8, 1972, 6 females ; Junes 4, 1974, 3 females, 3 males. On *Citrus limonum* (leaves) : Bagheria, May 9, 1972, 2 males ; May 16, 1972, 2 females ; May 27, 1972, 2 females. On *Citrus reticulata* (leaves) : Palermo, May 19, 1972, 3 females, 1 male ; May 27, 1972, 2 females, 1 male. Very common on citrus from May to October.

Verbenaceae : On *Citharexylum caudatum* (leaves) : Palermo (Botanical Gardens), March 27, 1973, 2 females.

Amblyseius swirski Athias-Henriot, 1962

Type locality and habitat : Holotype female and four paratype females were collected on *Prunus amygdalus*, Sept. 21, 1961 at Bet-Dagan (Israel) (ATHIAS-HENRIOT, 1962). Allotype male on *Citrus* sp. Aug. 7, 1962, at Gan Efrayim (Israel) (PORATH and SWIRSKI, 1965). It was also found in Egypt (ZAHER, RASMY, ABOU-AWAD, 1971) and Italy.

Location of types : Holotype female in the Laboratoire d'Acarologie de l'École Pratique des Hautes Études, Paris (ATHIAS-HENRIOT, 1962) ; allotype male in the collection of the Division of Entomology at the Agricultural Research Organization, Bet-Dagan, Israel (PORATH and SWIRSKI, 1965).

Record :

Rutaceae : On *Citrus limonum* (leaf) : Bagheria, May 16, 1972, 1 female.

Typhlodromus cryptus Athias-Henriot, 1960

Type locality and habitat : Syntypes, two females, one male on *Crataegus oxyacantha* subsp. *monogyna*, Dec. 5, 1956 in Algiers (Algeria) (Athias-Henriot, 1960 *a*). Found also in Italy. *T. cryptus subalgericus* (Abbasova), 1970 is found in Azerbaijan (U.S.S.R.).

Location of types : Syntypes in the Laboratoire d'Acarologie de l'École Pratique des Hautes Études, Paris (Athias-Henriot, 1960 *a*).

Records :

Betulaceae : On *Corylus avellana* (leaves and buds) : Polizzi, June 14, 1973, 2 females ; Ucria, Sept. 20, 1973, 2 females.
Caprifoliaceae : On *Viburnum* sp. (leaf, lower side) : Palermo, March 15, 1974, 1 female.
Fagaceae : On *Quercus ilex* (leaf) : Palermo (Botanical Gardens), March 1, 1974, 1 female.
Oleaceae : On *Olea europaea* (leaf) : Cefalù, June 15, 1974, 1 female.
Pittosporaceae : On *Pittosporum tobira* (leaves) : Palermo, March 15, 1974, 3 females.
Rosaceae : On *Prunus domestica* (leaf) : Polizzi, June, 4, 1973, 1 female. On *Prunus persica* (leaves, lower side) : Polizzi, June 11, 1973, 3 females. On *Eriobotrya japonica* (leaf, lower side) : Palermo, March 15, 1974, 1 female.
Rutaceae : On *Citrus limonum* (leaves and stems) : Bagheria, July 27, 1972, 3 females ; Monreale, Oct. 24, 1974, 2 females. On *Citrus aurantium* (leaves) : Scillato, July 22, 1972, 1 female ; Sept. 10, 1973, 2 females ; June 4, 1974, 4 females.

Notes : The Italian material was compared with the Syntypes of *Typhlodromus cryptus* Athias-Henriot and they were found to be identical in the structure of the insemination apparatus, the arrangement of setae and other characters.

The insemination apparatus of *Typhlodromus cryptus subalgericus* (Abbasova) (1970) is different from that of the Algerian and Italian specimens. It should be mentioned that solenostomes between setae L_6-L_7 are present in the Italian and Russian specimens as well as in the Algerian ones. They were used by Abbasova as one of the characters to distinguish between *T. cryptus* and *T. cryptus subalgericus* ; but they were erroneously omitted in the drawing of Athias-Henriot (1960 *a*, Fig. 38A) and are present in the Syntypes examined by us.

Typhlodromus intercalaris Livshitz and Kuznetsov, 1972

Type locality and habitat : Syntypes (females and males) were found on oak, in June 25, 1968, in Crimea (Livshitz and Kuznetsov, 1972).

Records :

Betulaceae : On *Corylus avellana* (leaves, lower side, along veins ; stems and buds) : Ucria, June 14, 1973, 3 females ; Sept. 20, 1973, 41 females, 7 males ; Polizzi, June 11, 14, 1973, 31 females, 3 males ; Oct. 8, 1973, 6 females.
Fagaceae : On *Quercus* sp. (leaves) : Scillato, July 6, 1972, 6 females.

Typhlodromus rhenanoides Athias-Henriot, 1960

Type locality and habitat : Specimens were collected on *Rosa* sp. April 14, 1955 at Maison-Blanche (Pté Piquer) (Algeria) (Athias-Henriot, 1960 *a*). Found also in California (Schuster and Pritchard, 1963) and Italy.

Records :

Araliaceae : On *Hedera helix* (leaf, lower side) : Palermo, March 14, 1974, 1 female.
Betulaceae : On *Corylus avellana* (leaves) : Polizzi, June 11, 1973, 16 females, 2 males.
Buxaceae : On Buxus sempervirens (leaves) : Palermo, March 12, 1974, 8 females ; Polizzi, June 4, 1973, 7 females, 2 males.
Caprifoliaceae : On *Viburnum* sp. (leaves) : Palermo, March 6, 1974, 3 females.
Fagaceae : On *Quercus* sp. (leaves) : Scillato, Feb. 9, 1973, 2 females.
Labiatae : On *Rosmarinus officinalis* (leaves) : Scillato, May 29, 1973, 3 females, 1 male.
Lauraceae : On *Laurus nobilis* (leaf) : Palermo, Apr. 5, 1974, 1 female.
Oleaceae : On *Olea europaea* (leaf) : Cefalù, June 15, 1974, 2 females.
Pinaceae : On *Araucaria* sp. (leaves) : Palermo, March 14, 1974, 1 female. On *Cupressus* sp. (leaves) : Palermo, March 12, 1974, 6 females ; Scillato, May 29, 1973, 1 female, On *Pinus halepensis* (leaves) : Palermo, March 14, 1974, 1 female.
Rosaceae : On *Prunus persica* (leaf, lower side) : Polizzi, July 12, 1973, 1 female. On *Prunus domestica* (leaf) : Polizzi, June 4, 1973, 1 female.
Rutaceae : On *Citrus limonum* (on the lower side of leaves, principally under spider webs and fruit calyces) : Bagheria, May 16, 1972, 2 females ; May 28, 1972, 1 female ; June 20, 1972, 3 females ; July 30-31, 1972, 48 females, 9 males ; Aug. 1, 1972, 5 females ; Oct. 19, 1972, 3 females ; Oct. 21, 1972, 1 female ; Oct. 27, 1972, 6 females.

Typhlodromus sapiens Athias-Henriot, 1960

Type locality and habitat : Holotype female was collected on *Quercus afares*, Feb. 26, 1957 and allotype male collected on *Quercus suber*, Dec. 4, 1959 in Algeria (Athias-Henriot, 1960 *a*). Found also in Italy.

Location of types : Syntypes in the Laboratoire d'Acarologie, de l'École Pratique des Hautes Études, Paris (Athias-Henriot, 1960 *a*).

Record :

Fagaceae : On *Quercus ilex* (leaves) : Palermo (Botanical Gardens), March 16, 1974, 3 females.

Paraseiulus erevanicus Wainstein and Arutunian, 1967

Type locality and habitat : On *Prunus cerasifera*, Jerevan (Armenia, U.S.S.R.), June, July, 1965, holotype and allotype (Wainstein and Arutunian, 1967). Found also in Sicily.

Location of types : In the Institute of Biology of Inner Waters, Borok, Yaroslavl, U.S.S.R. (Wainstein and Arutunian, 1967).

Record :

Rosaceae : On *Prunus cerasifera* (leaf) : Polizzi, June 4, 1973, one female.

Note : Our specimen closely resembles the original description of *P. erevanicus*. The measurements of setae are given in Table II.

TABLE II

Paraseiulus erevanicus Wainstein and Arutunian (setae in μ)

	D_1	D_5	L_1	L_2	L_3	L_4	L_5	L_6	L_7	L_8	L_9	L_{10}	M_1	M_2	M_3
1.	17	48	38	39	40	43	45	50	46	46	38	41	35	40	38
2.	16	45	40	35	40	45	45	50	50	40	35	35	35	40	40

1. From Italy.
2. Holotype (Wainstein and Arutunian, 1967).

Phytoseiulus persimilis Athias-Henriot, 1957

Syn. *Phytoseiulus riegeli* Dosse, 1958, *Amblyseius tardi* Lombardini, 1959.

Type locality and habitat : Holotype female, paratype and allotype male were found on *Rosa* sp. (glasshouse), March 12, 1957 in Staouéli (Algeria) (ATHIAS-HENRIOT, 1957). Found also in Chile (DOSSE, 1958). This species was introduced into many countries : Israel, established in nature (SWIRSKI and AMITAI, 1968) ; Lebanon, established in the Coastal Plain (DOSSE, 1967) ; in U.S.A. in 1964 (ZACK, 1969). It is used commercially in glass-houses against red mites.

Location of types : Syntypes in the Museum National d'Histoire Naturelle, Paris (ATHIAS-HENRIOT, 1957).

Records :

Betulaceae : On *Corylus avellana* (leaf) : Polizzi, Oct. 8, 1973, one female.

Euphorbiaceae : On *Ricinus communis* (leaves) : Palermo, Aug. 8, 1974, 20 females. It is very common on this plant from June to October.

Notes : Ph. persimilis is most probably a native of Sicily and was not introduced into it. LOMBARDINI (1959) described it as *Amblyseius tardi* from material found in Palermo on *Citrus* sp. in 1958.

Phytoseius (*Phytoseius*) *finitimus* Ribaga, 1902, sensu Denmark, 1966

Type locality and habitat : Specimens were seen on the lower surface of the leaves of *Buddleia madagascariensis* in Portici (RIBAGA, 1902). Allotype male was collected on leaves of *Rubus sanguineus*, Aug. 13, 1961, at Bet Dagan, Israel (SWIRSKI and AMITAI, 1961). Found in California (SCHUSTER and PRITCHARD, 1963) and in Sicily.

Location of types : Holotype in Ribaga's collection in Portici (DENMARK, 1966) and allotype male the Collection of the Division of Entomology, at A.R.O., Bet Dagan, Israel.

Record :

Rutaceae : On *Citrus aurantium* (leaf) : Scillato, July 12, 1972, 2 females.

Note : We have checked the orig. descr. of RIBAGA and the year is 1902 and not 1904.

Iphiseius degenerans (Berlese), 1889

Type locality and habitat : Leaves and moss, Italy (BERLESE, 1889). Found also in Algeria (ATHIAS-HENRIOT, 1957), Portugal, Tanganyika (CHANT, 1959), Turkey (DÜZGÜNES, 1963, from EHARA, 1966), Lebanon (DOSSE, 1967), Israel (SWIRSKI and AMITAI, 1961), Egypt (ELBADRY, 1970), Central Africa (PRITCHARD and BAKER, 1962) South Africa (VAN DER MERWE, 1968) and Hong-Kong (SWIRSKI and SHECHTER, 1961).

Location of types : In Berlese's collection, Florence (CHANT, 1959).

Records :

Araceae : On *Arum italicum* (leaves, lower side) : Mondello, Apr. 12, 1972, 3 females.

Euphorbiaceae : On *Ricinus communis* (leaves, lower side) : Palermo, June 30, 1972, 1 female ; Jan. 9, 1973, 3 females and 1 male.

Labiatae : On *Salvia officinalis* (leaves) : Palermo (Botanical Gardens), March 16, 1974, 2 females.

Rutaceae : On *Citrus limonum* (leaves) : Bagheria, May 16, 1972, 1 female ; June 4, 1974, 1 female.

On *Citrus aurantium* (leaves) : Scillato, July 12, 1972, 7 females ; Sept. 10, 1973, 1 female.

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