

Tetranychus lintearius Dufour, 1832, is a valid species (Acar.) Notulae ad Tetranychidas 11

by

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It has always been a problem whether or not *Tetranychus lintearius* Dufour, 1832, should be considered as a separate species. It is the type species of the genus *Tetranychus* Dufour, 1832, but nevertheless very insufficiently known. Owing to this fact the species has usually been synonymized with *Tetranychus urticae* C. L. Koch, 1836 (= *Tetranychus telarius* (L., 1758) in the sense of PRITCHARD & BAKER, 1955).

DUFOUR described the mite in 1832 with the following characteristics:

"*Tetranychus lintearius*, Tétranyque linger. Ovatus obtusus, ruber, pedibus dilutioribus; dorso pedibusque pilis albidis longis distinctis. Hab. gregarius in arbustis quos telis vestit."

Two figures complete this Latin diagnosis. The additional description and the notes on the biology are written in French.

DUFOUR found the specimens on the "ajonc", the gorse (*Ulex europaeus* L.), at the environs of Saint Sever, Landes, France. Shrubs with a diameter of several feet were entirely enveloped by a large, milkwhite web.

Although DUFOUR was aware of the existence of other spinning mites (*Trombidium socium*, *telarium* and *tiliarium*, p. 280), he had never seen them and so he thought his species to be entirely new. As he believed the legs to end in four little claws, he composed for his new genus the name *Tetranychus*, and as he was highly impressed by the heavy spinning, he introduced as species name the word *lintearius*, meaning a merchant of linens or a linen-weaver. Due to a lapsus calami or a printing error the word is spelled in the title: *lintearicus*. This has caused some uncertainty. The correct spelling is *lintearius*. This is not only proved by the Table des planches (p. 462) and the Table des matières (p. 463) at the end of vol. 25 of the Annales (April 1832), which both give the spelling *lintearius*, but moreover there is an official erratum on page 464: "au lieu de *lintearicus*, lisez *lintearius*". This very inconspicuous erratum has never been quoted. Even OUDEMANS (1937 : 1038) did not discover it.

In his extensive description in French DUFOUR observed that strictly speaking the four "ongles" perhaps better should be considered as peculiar setae, but that they are not white, nor as long as the hairs of the body and the legs.

The words "gregarius in arbustis" of the Latin diagnosis have caused a lot of misunderstanding. DUFOUR did not realize that his mite was monophagous on the plant genus *Ulex*, and later workers understood that it would occur on a variety of shrubs.

Two years later, May 1834, GACHET mentions the mite again, giving some additional details. He found it on a "lande" near Bordeaux (France).

BOUDREAUX & DOSSE (1963 : 360) consider *Tetranychus lintearius* Dufour sensu Gachet, 1834 as a synonym of their Carmine Mite, *Tetranychus telarius* (L.,

1758) sensu Boudreaux, 1963 (= *Tetranychus cinnabarinus* (Boisduval, 1866) sensu Boudreaux, 1956). Considering that GACHET found his mites on *Ulex* and that his biological and morphological remarks are entirely in accordance with DUFOUR 1832 and with my own observations, I do not believe that their "new synonymy" is correct.

After those first observations *Tetranychus lintearius* has been reported a number of times between 1856 and 1872, then once again in 1902 and in 1920. I can add a personal observation of 1955, provisionally published in 1959, as well as two recently discovered localities in England (1964) and France (1965), discussed below. During the past 133 years there has been a lot of confusion and the fact that the name has gradually been reduced to synonymy and that the mite is relatively rare has highly contributed to its virtual disappearance from lists of valid species. This situation proves not to be correct and so I wish to re-establish the name *Tetranychus lintearius* as a valid one for the red spider mite living on plants of the genus *Ulex*, at least *Ulex europaeus* L. and *Ulex nanus* L.

It may be of help to future workers to give a brief review of the older works in which I found *Tetranychus lintearius* mentioned. There may be more publications! Many of these papers are difficult to trace, because the records were less complete than they are now. All references up to 1850 can be found in OUDEMANS (1937 : 1039—1041).

TREVISAN (1852) only mentions *Tetranychus lintearius* as the type species of the genus *Tetranychus* Dufour, 1832.

NEWMAN (Jan. 1856), citing a letter of Milner BARRY and giving information received from R. H. MEADE, exhibited a mass of silk spun by a minute *Acarus*. From BARRY's letter we see that he collected them at Rusthall Common (near Tunbridge Wells, Kent), living on furze [*Ulex europaeus*]. NEWMAN sent the mass to the arachnologist MEADE who replied that the mites belonged to the genus *Tetranychus* of DUFOUR, "the type of which is the *Acarus telarius* of Linnaeus". This was an error; the type species is *T. lintearius* of DUFOUR. This wrong idea has caused several errors in literature. MEADE could not find any description of the species. He evidently had not seen DUFOUR's paper, or could not read the French language. MEADE saw correctly that the mites were closely allied to the common *Tetranychus telarius* (L.) [= *T. urticae* C. L. Koch], but he did not introduce a new name. Finally NEWMAN added some observations of his own and was of the opinion that the web will protect the mites from being washed away by the rain.

NEWMAN (Feb. 1856). Same text as January 1856.

WEBER (1856) mentions the genus *Tetranychus* Dufour, 1832, with the type species *lintearius*. He includes it in his "Spinnmilbe" (the red spider mite in general) which he calls *Tetranychus telarius* Dugès, 1834. Yet he indicates that the name *telarius* originates from LINNAEUS. He writes that DUGÈS has maintained the name *Tetranychus* of DUFOUR and changed the species name into *telarius*. This is incorrect. DUGÈS (1834 : 25) considered *T. lintearius* (*lintearicus* in his work), living on *Ulex*, to be a valid species and he added his "Tétranyque tisserand" with the name *Tetranychus telarius* L. (and four more species of "*Tetranychus*") to DUFOUR's mite. *Tetranychus telarius* of DUGÈS is the red spider

mite in a broad sense, for which DUGÈS enumerates a variety of host plants. But he did not mention *Ulex* for this species because he had already accepted *T. lintearius* Dufour as a separate and valid species.

LABOULBÈNE (1865) records *Tetranychus lintearius* from *Camellia*; it was identified by LUCAS. This must have been a different species, most probably *Acarus coccineus* Schrank as described by BOISDUVAL (1866 : 87).

BOISDUVAL (1866 : 92) indicates as *Acarus linger*, *Acarus lintearius*, a mite spinning small webs and living on the underside of the leaves of the "séringat" [*Philadelphus coronarius* L., the syringa], where it does hardly any harm. Of course this also referred to a different species.

COOKE (1867). This anonymous publication is ascribed by OUDEMANS in his private notes to M. C. COOKE, the editor of *Hardwicke's Science Gossip*. Strictly speaking COOKE was more of a botanist and a mycologist than a zoologist, but actually he published books on quite a number of biological subjects. The author begins his paper by quoting NEWMAN's communication of 1856, including the letter from BARRY and the reply by MEADE, but strangely enough he does not mention NEWMAN at all, so that the reader gets the wrong impression that all observations originate from Milner BARRY. Again no name is given in that paper for BARRY's mite. Of *Tetranychus lintearius* COOKE says that it is "a red species which is not confined to any kind of tree in particular, but which spins a web resembling that of a spider, and dwells in societies". He also had not read DUFOUR's paper and based his opinion on the Latin diagnosis. In all COOKE mentions and partly figures 13 species of "*Tetranychus*".

SPICER (1868) refers to COOKE 1867. He received from Mr. J. C. WHITE a liberal supply of a web-forming mite, collected from the common furze (*Ulex europaeus*) at Budleigh Salterton (Devon) in 1867. He gives an extensive description of the mite and of its way of spinning. The mites are anything but common. Apparently they do not spin between March and August. SPICER succeeded "in establishing a colony on a furze bush in this neighbourhood..... About a fortnight ago, they had attached themselves to their new home, and were safely concealed under their canopy of silk, in spite of a good deal of rough weather". He mentions (p. 51) *Tetranychus ulmi* and *T. lintearius* as being closely related and he gives the references, but "of *Tetranychus lintearius* I have had no opportunity of seeing a figure". So he has not been able to read DUFOUR's publication and was therefore not aware of DUFOUR's host plant. Evidently he had only DUFOUR's Latin diagnosis at his disposal which he correctly assessed as being meagre, "brief enough to have satisfied Linnaeus himself". If he had had DUFOUR's paper on his desk, he would have understood more! As a result of his studies he concluded that *T. lintearius* is "being said to occur on shrubs generally; whereas the present species is, I believe, restricted to the furze or gorse". The result is a new name: *Tetranychus ulicis* (The Furze Mite).

With this mite he found other mites of a dark green colour and he was not sure whether these belonged to the same species. If they were not the green nymphal stages or the males indicated by HOWLETT (1868), one might think of nymphae of *Bryobia ulicis* van Eynhoven which species is rather common. By the lens its nymphae have more or less the same aspect as nymphae of *Tetranychus*.

COOKE (1868). Following SPICER's paper some additional records from England were published. COOKE, as the editor, cites furze mites from Croydon, near London, collected by W. T. LOY.

WHITE (1868) found the mites at Virginia Water, near London.

H[OWLETT] (1.IX.1868) discovered a large number of them in Tunbridge Wells (Kent).

HOWLETT (1.XII.1868) gives extensive and very interesting notes on the biology. He observed the life cycle of the mites and was the first to describe the males which have a "real bright green abdomen, slightly turned up at the end. They are not young ones for these have a different sort of green, and accompanied by a fat abdomen and shorter legs". [Personally I have only seen males of a dark red colour.]

LUCAS (1868) reports that he observed *Tetranychus lintearius* on various occasions at Roscoff, Bretagne (Brittany), on *Ulex europaeus*. At first he did not find any mites in the webs, but later he succeeded in observing red speckles caused by a red "dust" which actually consisted of mites. The size of the webs was several meters. *Ulex europaeus* was extremely common in that region and was widely used to form hedges.

He had observed these webs already as early as 1852 in the surroundings of Arcachon and La Teste (Gironde).

From his notes it appears that the mite is not very common and only spins its webs locally.

Of course LUCAS had read DUFOUR's paper of which he gives the reference, and evidently he was so enthusiastic and so satisfied with the observations of that author, that this text of page 742 is practically word for word that of DUFOUR 1832, p. 277—278, although he is presenting it as his own!

LUCAS (1869) published a second record, this time from Normandie (Normandy), where J. J. GIRAUD had collected it for him at Fécamp. LUCAS himself had never observed the mites during his visits to Normandie (Les Calvados, especially Honfleur) in 1863, 1864 and 1865, where the gorse was much less abundant than in Bretagne. In Bretagne *Ulex* sometimes caused so much hindrance that it was burned down. After GIRAUD's discovery LUCAS went again to Normandie and this time he found the mites on the Plateau de Vasonry not far from Honfleur. He adds that nevertheless the mite is very rare in this area.

SPICER (1871) found the species near the station on Weybridge Heath, near London.

When we compare the rather numerous observations during the years 1868—1871 both in France and in England, it appears that the various authors evidently had no exact knowledge of what had been published in the other country.

MURRAY (1877) gives an uncritical recapitulation of DUFOUR (1832), LABOUBÈNE (1865), BOISDUVAL (1866) and LUCAS (1869). It should be observed that the "seringat" of BOISDUVAL, correctly translated as syringa or sweet pipe by MURRAY, has the scientific name *Philadelphus coronarius* L., and that it has nothing to do with the botanical genus *Syringa* L. (Fr.: lilas, Engl.: lilac)¹).

¹) I am indebted to Dr. S. J. VAN OOSTSTROOM, Leiden, for his assistance in this botanical question.

GROULT (1887 : 51—52) gives a review of several species of *Tetranychus*. He does not use the name *T. telarius* of LINNAEUS, but employs the name *lintearius* to indicate the red spider mite in general. The food plants which are mentioned are *Tilia*, *Rosa* and *Sambucus*.

OUDEMANS (1902) publishes an observation of A. BRANTS who saw great quantities of *Ulex europaeus* at Cancale, Bretagne, wholly covered with the silvery tissue of millions of mites. At that moment OUDEMANS called the species *Tetranychus telarius*. I suppose that he had not yet seen DUFOUR's publication. In this period OUDEMANS had chosen the spelling *Tetranychus* Agassiz, 1846 (p. 366) which he considered to be the correct one for reasons of orthography (1908 : 71).

HIRST (1920), after some 20 years, is until 1959 the first and the last author to publish a new record of the species. He found it on the Malvern Hills (on the Herefordshire/Worcestershire border) in 1917. He observed masses of white webs and collected many hundreds of specimens, but only one single male. The webs on the Malvern Hills were common and sometimes so big that the bushes of *Ulex* had to be burned.

In his description of 1920 HIRST gave a few characters in order to separate the species from the Common red spider mite (*Tetranychus urticae* C. L. Koch, 1836 = *T. telarius* (L., 1758) in his paper), the usual mite on weeds, on cultivated plants, in greenhouses, etc. The easiest differentiating characters are found in the male and it must be said that HIRST, with only one male specimen at his disposal, detected all important differences. These differences are discussed below.

OUDEMANS (1923), on exhibiting a winter nest of *Tetranychus telarius* [= *Eotetranychus telarius*] on *Tilia*, mentions also the observation published in 1902. This time he speaks of "milliarden" (milliards, in American = billions) of mites. Here he still calls the species *T. telarius*.

OUDEMANS (1930) discusses the fact that many authors have incorrectly considered *Acarus telarius* L., 1758 to be the type species of *Tetranychus* Dufour. The correct type species is *T. lintearius* Dufour.

OUDEMANS (Jan. 1931) shows that according to the type species the genera *Tetranychus* and *Oligonychus* cannot be synonymous.

OUDEMANS (Mar. 1931) observes that HIRST, apart from DUFOUR 1832, was the only one who has looked for, found, and studied *Tetranychus lintearius*. This is not entirely true, but HIRST was the first to make a valuable comparative study. That his meagre description of barely 12 lines is valuable, is due to the fact that he was a good observer, having discovered a few important differences. OUDEMANS could not know the value of these details, as he was strongly handicapped by the fact that, notwithstanding all his efforts, he had never seen a specimen. In his paper he makes a small error by saying that HIRST described only the penis and the terminal segment of the palp of the male. But HIRST also described the second leg of the male, which actually shows one of the best differential characters; moreover his figures are most useful. OUDEMANS furthermore shows that, according to the type species, the genera *Tetranychus* and *Epitetranychus* are synonymous.

OUDEMANS (1937 : 1038—1039), when compiling his great work, finally decided to retain *Tetranychus lintearius* as a separate species.



Fig. 1, Webs of *Tetranychus lintearius* on *Ulex nanus* at Bourré.

On the 25th September 1955 I collected *Tetranychus lintearius* from *Ulex nanus* L., at Bourré, near Montrichard (Loir-et-Cher), France. It occurred there exactly as described by DUFOUR, spinning profusely, making webs all over the plants (fig. 1). I found it on this host plant only, although *Ulex europaeus* was also growing in this locality. On *Ulex nanus* it was only local, at least typical webs were scarce. There was no question of such a heavy infestation as mentioned by LUCAS and HIRST.

I have the same impression as earlier authors that this species is not at all common. I personally have examined many vegetations of *Ulex* both in France and in Great Britain (England, Scotland and Wales), but I never discovered the mite again.

On the 22nd July 1964 I visited the Malvern Hills. *Ulex* is still very common, but I saw no webs on it. This may be due to the time of the year, as most observations are dating from August or later. I was told by a gentleman, living there, that the webs are still a regular phenomenon. I also did not observe any specimen of *Tetranychus*; only *Bryobia ulicis* was rather common on the shrubs.

A visit to Rusthall Common near Tunbridge Wells (Kent) on the 1st August 1964 equally had no result. Here also it may have been too early in the season, or the mites had disappeared in the past 108 years. *Bryobia ulicis* was common.

In the British Museum (Natural History), London, I saw a fragment of *Ulex europaeus*, collected by T. R. EAGLES at Danbury Common, Essex, 18.VII.1964. The little twig was perfectly spun in and the web contained hundreds of mites. At the collection date the spinning was only starting.

Dr. W. HELLE, Amsterdam, collected *Tetranychus lintearius* from *Ulex europaeus* at Ploëmel, near Carnac (Dept. Morbihan, Bretagne, France) on June 15th,

1965. As at Bourré, 1955 (VAN EYNDHOVEN), the mites occurred very locally, a few separate shrubs only being infested amidst a great number of sound bushes. Those shrubs, yet, were well covered by a dense web, spun by countless numbers of Acari. All stages from egg to adultus were present, also the males. Dr. HELLE brought home some branches with living specimens (fig. 2); as far as I could ascertain from this material, the males were present in a fair number, though much less numerous than the females.



Fig. 2, Twig of *Ulex europaeus* with web and mites. Photo HELLE.

Dr. G. KRUSEMAN visited Saint Sever, the locus typicus, on the 14th September 1965. There were lots of *Ulex*, but he did not see any trace of *Tetranychus*.

After so many years only the following localities are known:

France: Paris (Saint Germain [see below]); Normandie (Honfleur, Fécamp); Bretagne (Cancale, Roscoff, Ploëmel); Loir-et-Cher (Bourré); Gironde (Bordeaux, Arcachon/La Teste); Landes (Saint Sever).

Great Britain: Surrey (Croydon, Weybridge/Virginia Water); Kent (Tunbridge Wells/Rusthall); Essex (Danbury); Worcestershire/Herefordshire (Malvern Hills); Devon (Budleigh Salterton).

In The Netherlands *Ulex europaeus* is rare because of the unfavourable climate for this atlantic plant. OUDEMANS examined some vegetations long ago, and I did so more recently, but we never found any *Tetranychus* on it. *Bryobia ulicis* has also not yet been found.

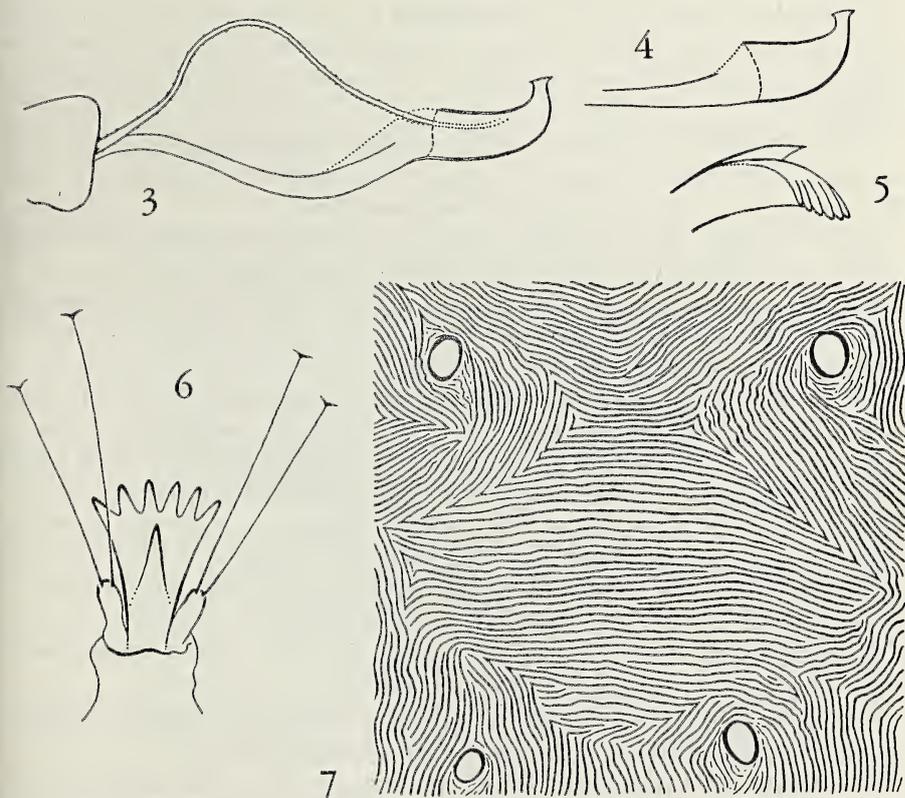
This latter species which I described from France and Great Britain in 1959, seems to be rather common, though also present only locally. I found it again on

various occasions. In my original description (1959 : 44) I mentioned the presence of *Tetranychus lintearius* at Bourré (near Montrichard). The correspondence with the late Prof. A. Earl PRITCHARD, which resulted from my publication, caused me to resume thorough investigations on validity of the species *Tetranychus lintearius*.

As a result I can say that I fully confirm the opinion of HIRST, namely that it is a separate species. The most striking male character is the empodium of tarsus II, which forms a small cup called Cardium-shell by OUDEMANS (1930 : 165), and which is of about the same shape as that of empodium I (fig. 5—6). I know no other species which shows this character, and it is so conspicuous that it can be seen at first glance. At first one may think that the empodium is mutilated and that the usual 6 needles are broken, but the character is present in all males, exactly as HIRST mentioned and figured it.

The relatively thick aedeagus and its knob also offer a rather good character (fig. 3—4).

I am happy to say that I finally succeeded in finding also a valuable morphological difference in the female. It is found in the striae of the back at the diamond shaped pattern between the setae lumbales internae and sacrales internae (third



Tetranychus lintearius. Fig. 3, aedeagus with ductus ejaculatorius; fig. 4, aedeagus; fig. 5, lateral view of male empodium II; fig. 6, dorsal view of male empodium II; fig. 7, dorsal striae of female between setae lumbales internae and setae sacrales internae. B. WEIJDE del.

and fourth pair of dorsocentral hysterosomals). All species or forms known to me of the *Tetranychus urticae* complex have the space between the hairs of the third dorsal pair filled up by vertical, outward curved striae. In *T. lintearius* these vertical, curved striae are only few in number and situated close to the seta. Between them the horizontal striae of the back show a deep central sinking and so are touching the horizontal striae of the diamond shaped pattern for some distance. This distance is variable and may be shorter or longer, but the aspect is normally always present (fig. 7). In a few abnormal specimens this character seems to be absent.

The late Prof. Marc ANDRÉ, La Varenne, sent me a number of specimens collected at Saint Germain near Paris, France, by H. LUCAS, as long ago as about 1850.

Dr. J. G. SHEALS of the British Museum (Natural History), London, enabled me to compare specimens originally from HIRST (Malvern Hills, May 1917, S. Hirst).

Both samples show the same type of dorsal striae as my own recent material. The mites collected by Dr. HELLE in 1965 also show the specific characters enumerated above for the male and the female.

Tetranychus lintearius may be considered to be closely related to the *T. urticae* complex, so we cannot expect too many striking characters. Up to now I found the following additional differences between *T. lintearius* and *T. urticae* (from *Urtica dioica*):

1. The female of *T. lintearius* has plain dorsal integumentary folds. They lack the small lobes typical for e.g. *T. urticae*, *T. cinnabarinus* (Boisduval) sensu Boudreaux (= *T. telarius* (L.) sensu Boudreaux), etc.

2. The swollen terminal sensory seta and the fusiform sensory seta of the female palpal tarsus are shorter and therefore proportionally wider than in *T. urticae*. Proportion of length: *lintearius* 4 : *urticae* 5. HIRST found the same difference (1920 : 56, fig. 4d and 4f). It is so conspicuous that I discovered it without having consulted HIRST's publication.

3. The swollen dorsal seta on the second palpal segment of the male is somewhat longer than that in *T. urticae*. Proportion of length: *lintearius* 5 : *urticae* 4.

4. I do not see the club-shaped aspect of the dorsal finger of the male palpal tarsus, as indicated by HIRST and drawn after his single male (1920 : 56, fig. 3e). In my material it is cylindrical and variable, though on an average somewhat shorter than the equally variable dorsal finger of *T. urticae*.

The females of *Tetranychus lintearius* are measuring from 440 to 500 μ in length. The males are comparatively large, about 360 μ .

Living specimens. The mites collected by Dr. HELLE enabled me to make some notes on the colour of living specimens.

The eggs are often laid in clusters at the basis of the small branches. They are yellowish, gradually becoming brownish or even orange-brown.

The larvae are orange; the protonymphs orange with some blackish lateral spots; the deutonymphs orange, reddish or sometimes greenish, also with some blackish lateral spots.

The females are of a bright red colour with inconspicuous dark spots; the colour of the males is dark red.

Genitalia. The aedeagus (fig. 3—4) has a separate ductus ejaculatorius which makes a wide curve within the abdomen and enters the aedeagus near the shaft. Externally it is dispersedly verrucose. This ductus was apparently not observed by BLAUVELT (1944 : 31, Pl. 10, fig. 48) who describes a penial canal (P.C.) running through the stem of the aedeagus.

At the female copulation orifice starts a very narrow ductus which leads to the receptaculum seminis. I have not succeeded in observing the exact contours of this receptaculum.

Damage. The damage to the *Ulex* branches collected by Dr. HELLE was considerable. Many of the young branches and leaves or spines had become white with green speckles after the attack of the mites. The tips of the spines were often entirely white.

Teratology. One male has a transversal row of 5 setae sacrales (2 left hand internae).

I believe that the various characters enumerated will suffice. The concept of *Tetranychus lintearius* as a separate valid species is entirely confirmed by biological facts (large webs and host plant).

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De ♂♂ van *Macrothylacia rubi* L. op licht (Lep., Lasioc.). In de *Catalogus* (7e suppl., pag. 161) kan men lezen, dat de mannetjes van *M. rubi* L. slechts een enkele keer op licht komen. Dit klopte (tot nog toe!) heel aardig met onze eigen ervaring.

Edoch, tot onze niet geringe verbazing verschenen verleden jaar op ons vanglaken te Vlodrop (staand scherm met aan weerszijden een M.L.-lamp van 250 watt) tientallen *rubi*-mannetjes, meest in het begin van de avond.

Mogelijk zaten we wel in het optimale biotoop voor deze soort, want het aantal aanvliegers (♂♂ en ♀♀) was zeer hoog. Sommige wijfjes zetten op het laken hun eitjes af.

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