Damage on sweet orange fruits by the mite *Polyphagotarsonemus latus* (Banks) and the population of its predatory mites in Southwestern Nigeria

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Abstract — **Introduction**. Scars and blemishes on citrus fruits render them unacceptable to prospective local buyers as well as the export market. To ameliorate this situation, the populations of the phytophagous mite *Polyphagotarsonemus latus* Banks (one of the agents at the origin of the damage observed) and its predatory mites were assessed in an orchard in the National Horticultural Research Institute (NIHORT), Ibadan, Nigeria, during the 2000 and 2001 fruiting seasons. The damage inflicted upon the fruits of 12 varieties of orange trees was studied jointly. The aim of the study was to identify appropriate periods to initiate control and to assess varietal effects on mite attack. **Materials and methods**. Twelve varieties of sweet oranges arranged in a randomized complete block design with four replications were used for the study. A stand of each variety was sampled per replicate to assess mite population and damage. **Results and discussion**. Mite populations and their damage on sweet orange varieties increased to fruit maturity. Washington Navel, Valencia Late, Agege and Lue Gin Gong varieties were most susceptible to mite attack and recorded higher fruit damage than the other varieties. The populations of the predominant predatory mites (the Bdellidae family) that attacked *P. latus* were significantly ($P < 0.05$) correlated with their prey at high population periods. The detrimental effects of pesticide overuse on natural enemies were highlighted. **Conclusion**. The progressive increase in mite population suggests the need for initiating control of phytophagous mites in July before the peak population period of September for Nigeria.

Nigeria / *Citrus sinensis* / variety trials / fruits / *Polyphagotarsonemus latus* / pest mites / pest control

Dégâts de *Polyphagotarsonemus latus* à la production d'oranges du sud-ouest nigérian et étude de ses parasitoïdes.

Résumé — **Introduction**. Les cicatrices et les défauts des agrumes les rendent inaptes à la vente locale et au marché d'exportation. Pour améliorer cette situation, les populations de l'acarien phytophage *P. latus* Banks (l'un des agents à l'origine des dégâts observés) et de ses parasitoïdes ont été évaluées dans un verger de l'Institut de recherche horticole national (NIHORT), à Ibadan, Nigéria, pendant les saisons de production 2000 et 2001. Conjointement, les dommages infligés aux fruits de 12 variétés locales d'oranger ont été étudiés. Le but de notre étude a été d'identifier les meilleures périodes de contrôle de l'acarien et d'évaluer la sensibilité des différentes variétés d'oranger à l'attaque de l'insecte. **Matériel et méthodes**. Douze variétés d'orange douce placées selon un dispositif en blocs complets randomisés, avec quatre réplications, ont été utilisées pour notre étude. Un représentant de chaque variété a été échantillonné par réplication pour évaluer la population du phytophage et ses dommages. **Résultats et discussion**. Les populations de l'acarien et ses dommages sur les différentes variétés d'orange douce ont augmenté jusqu'à la maturité de fruit. Les variétés Agege, Lue Gin Gong, Valencia late et Washington navel ont été les plus sensibles à l'attaque du parasite et leurs fruits ont subi des dommages plus élevés que ceux enregistrés pour les autres variétés. Les populations des parasitoïdes prédominants (famille Bdellidae) qui ont attaqué *P. latus* ont été significativement ($P < 0.05$) corrélées avec leur proie aux périodes de forte population. Les effets néfastes de l'abus de pesticide sur les ennemis naturels du parasite ont été soulignés. **Conclusion**. L'augmentation progressive de la population du ravageur suggère d'effectuer un contrôle du phytophage en juillet avant qu'il atteigne son pic de population observé en septembre au Nigéria.

Nigéria / *Citrus sinensis* / essai de variété / fruits / *Polyphagotarsonemus latus* / acarien nuisible / lutte antiravageur

1. Introduction

Citrus production in Nigeria is faced with pest and disease constraints. These are often compounded by poor farmers' adoption of ideal citrus production practices. Besides the meager yields recorded in most orchards, there is often poor fruit quality due to damage by pests and diseases.

The aesthetic quality of a citrus fruit contributes towards the determination of its market price. Pest attack on citrus fruits may manifest as blemishes that render the fruit unacceptable to prospective buyers. Mites are among the group of pests that reduce the market quality of citrus fruits. Recent observations in citrus groves in Ibadan in Southwestern Nigeria indicated that mites, hitherto neglected as unimportant and sporadic pests of citrus fruits, are becoming economically important. The occurrence is most prevalent in situations whereby ideal citrus cultural practices are not applied or broad-spectrum insecticides are constantly used. It has been reported that certain broad-spectrum insecticides adversely affect mites' natural enemies and sometimes increase mite populations, probably by enhancing reproduction. Insecticides can also alter plant physiology to favor mite abundance [1].

The insecticides used in most citrus orchards in Nigeria include cypermethrin, fenitrothion, lambda cyhalothrin and dimethoate [2]. They are usually applied at a high rate and mite populations are increased because most of their natural enemies are eliminated. With favorable climatic conditions and the appropriate phenological stage of citrus, high populations of mites such as the citrus red mite *Panonychus citri* McG., the citrus rust mite *Phyllocoptruta oleivera* Ashmead, the broad mite *Polyphagotarsonemus latus* Banks and the citrus thrip *Scirtothips aurantii* Faure are known to adversely affect the aesthetic value of citrus [3, 4]. Efficient production of acceptable citrus fruit in mite endemic orchards therefore relies on proper management of implicated species [5].

Polyphagotarsonemus latus, usually encountered in orchards in Southwestern Nigeria, feeds on young tender leaves or fruit tissue. The toxic saliva that is injected by this mite can result in significant damage. When the population becomes dense, fruit damage increases. Fruit feeding results in scarred tissue that cracks as the fruits grow, leaving a characteristic pattern of scars and intermittent new tissues. Damage starts at about 3-cm fruit diameter, preferably on the shady portions of the attacked fruits. The ultimate result of attack is the formation of silvery gray discoloration of fruits. The pest may also cause misshapen and russeted fruits at advanced stages [6]. It is particularly troublesome on lemons, some mandarins and grapefruits. However, it also attacks lime [7] and sweet oranges and renders the fruits unattractive to consumers.

Light oils have been recommended for mite control, but they have hardly been used by commercial citrus producers due to their unavailability in the market. Biological control of citrus mites has not been investigated in Nigeria. Although predatory mites such as *Typhlodromalus* spp. (Acarina: Phytoseiidae), known to be found on citrus and other crops, were better established on cassava in Southwestern Nigeria [8], their activities on pest mites associated with citrus are still obscure. Therefore, our work is timely in providing basic information needed in the development of integrated management strategies for *P. latus* and other mites.

We aimed at identifying the peak population period of *P. latus*, assessing the effect of sweet orange varieties on the population of *P. latus* and fruit damage, and identifying the families of the predatory mites associated with *P. latus* and their population dynamics in relation to that of the pest mites.

2. Materials and methods

A citrus orchard at the National Horticultural Research Institute in Ibadan (3° 5' E and 17° 3' N), Nigeria, was used for the study in 2000 and 2001. The orchard was planted in the mid-1980s with 12 varieties of sweet orange, namely: Agege, Bende, Brown, Carter Navel, Etinam, Lue Gin Gon, Meran, Hamlin, Pineapple, Umudike, Valencia Late and Washington Navel.

Ibadan has a bimodal rainfall pattern with an annual mean of about 1278 mm, a mean annual temperature of 26.2 °C and a radiation of 10.7 $MJ \cdot m^{-2} \cdot day^{-1}$. The average annual rainfall during the two trial periods was 1014 mm and 1326 mm in 2000 and 2001, respectively. The varieties were prearranged in a randomized complete block design with four replications in the orchard. Each block was made up of the 12 sweet orange varieties, and three stands of each variety arranged together in a straight line. A stand of each variety per replicate was randomly selected, tagged and sampled for all parameters investigated throughout the study period.

Sampling was initiated in June 2000 (when fruits were formed) and was maintained at 2-week intervals until November. This involved selecting five points each from the upper and lower portions of the canopy (within clear visual distance) and from the outer and inner parts of each selected stand; thus totaling ten points per tree. At each point, observations were made on a partially shaded fruit and its immediate two surrounding young leaves from the same twig with the aid of a hand lens of 10 × magnification. The population of *P. latus* and its predatory mites on the leaves and fruits were counted *in situ* and recorded. The level of bloom during the sampling periods was assessed by observing for the presence of flowers at the tip of twigs of each sampling point. The number of fruits damaged by *P. latus* (symptom of silvery patches) was recorded. Representative samples of mites were collected and preserved in 70% ethanol for confirmation in the laboratory using identification keys.

2.1. Statistical analysis

Data collected on pest mite and predatory mite populations, damaged fruits and those of percentage of bloom were transformed for analyses. Logarithm transformation was used for mite populations and fruit damage data, while arcsine transformation was used for percentage of bloom. All the data were subjected to analysis of variance (ANOVA). Significant treatment means were separated using the Student-Newman-Keuls test. The relationship between the levels of bloom and *P. latus* populations was established through correlation analyses. Correlation analyses were also undertaken between damaged fruits and mite populations and between predatory mites and pest mite populations. All tests were considered significant at $P \leq 0.05$ using the SAS program [9].

3. Results

3.1. *P. latus* population dynamics in sweet orange varieties

In our 2000 experiment, populations of *P. latus* increased in most sweet orange varieties from the June–August months, peaked in September and decreased towards harvest periods. However, there was no significant ($P < 0.05$) difference between these populations in the 12 varieties in June, July and August. In August, all the varieties became infested with mites except Carter Navel and Umudike (*table I*), with the highest population of mites per sampling point observed in Agege variety. In September, there were remarkable increases in mite population with significant differences in the 12 sweet orange varieties. A significantly higher population of mites (mean of 7.9 mites per sampling point) was observed in Valencia Late compared with the other varieties, except Agege and Lue Gin Gon, which also recorded relatively high populations of 6.2 and 6.5 mites per sampling point, respectively (*table I*). Bende, Carter Navel, Etinam, Parson Brown and Umudike recorded relatively low mean populations of mites. The population of mites generally decreased in October, with no significant differences between the sweet orange varieties, despite the high mite population observed in Valencia Late.

In the 2001 study, the observed results were similar to those of 2000. With the exception of Agege and Lue Gin Gon, a significantly higher population of mites was observed in September on Valencia Late than on other varieties (*table I*). The lowest populations of mites were observed on Bende, Hamlin, Meran and Parson Brown

Table I.
Populations of *Polyphagotarsonemus latus* in twelve sweet orange varieties and their maximum bloom levels in the 2000 and 2001 fruiting seasons in Ibadan (Nigeria).

Sweet orange varieties	Mean population ± standard error per sample point[1]										% of maximum bloom	
	June		July		August		September		October			
	2000	2001	2000	2001	2000	2001	2000	2001	2000	2001	2000	2001
Agege	1.0 ± 0.41	0	1.0 ± 0.5	1.5 ± 0.5	1.7 ± 0.25	2.5 ± 0.28	6.5 ± 2.44 ab	4.5 ± 0.6 ab	2.5 ± 0.25	6.5 ± 1.5 ab	72.5 ± 3.4	70.0 ± 5.1
Bende	0	0	0	0	0.5 ± 0.28	0.8 ± 0.25	0.7 ± 0.42 c	0.3 ± 0.25 d	0	0.3 ± 0.25 b	67.5 ± 7.2	60.0 ± 4.7
Carter Navel	0	0	0	0	0	0.5 ± 0.28	1.2 ± 0.25 c	1.0 ± 0.4 bcd	0.5 ± 0.28	0.8 ± 0.25 b	37.5 ± 6.9	50.0 ± 10
Etinam	0	0	0	0	0.5 ± 0.2	0.3 ± 0.2	1.5 ± 0.5 c	0.8 ± 0.47 cd	0.7 ± 0.42	1.8 ± 0.7 ab	55.0 ± 7.5	70.0 ± 6.9
Hamlin	0	0	0	0	1.2 ± 0.25	0	2.7 ± 0.47 bc	0 d	2.0 ± 0.9	0.8 ± 0.25 b	47.5 ± 4.3	57.0 ± 4.1
Lue Gin Gon	0.5 ± 0.28	0	0.5 ± 0.28	0	1.0 ± 0.2	0.5 ± 0.2	6.2 ± 1.3 ab	4.3 ± 1.1 abc	1.0 ± 0.2	7.0 ± 1.22 a	57.5 ± 7.5	50.0 ± 6.7
Meran	0	0	0	0	0.2 ± 0.2	0.	2.2 ± 0.42 bc	0 d	1.5 ± 0.5	0.5 ± 0.28 b	72.5 ± 5.6	55.5 ± 5.1
Parson Brown	0	0	0.3 ± 0.25	0	0.7 ± 0.25	0	1.9 ± 0.4 c	0 d	0.5 ± 0.28	1.8 ± 0.47 ab	60.0 ± 9.1	50.0 ± 10.9
Pineapple	0	0	0	0	1.5 ± 0.29	0	3.9 ± 0.48 bc	0.3 ± 0.2d	2.7 ± 0.62	0 b	65.0 ± 9.7	45.5 ± 4.1
Umudike	0	0	0	0	0	0.3 ± 0.2	0.7 ± 0.25 c	1.8 ± 0.62 bcd	0	0.8 ± 0.47 b	45.5 ± 6.5	50.0 ± 6.4
Valencia Late	0	0	1.0 ± 0	2 ± 0.4	1.5 ± 0.64	2.5 ± 0.25	7.9 ± 1.1 a	7.0 ± 1.27 a	4.0 ± 0.7	4.8 ± 0.7 ab	70.0 ± 9.1	65.0 ± 6.4
Washington Navel	0	0	0.5 ± 0.2	0	1.5 ± 0.5	1.0 ± 0.2	4.7 ± 0.47 abc	3.3 ± 0.47 bcd	1.5 ± 0.5	7.3 ± 1.8 a	50.0 ± 10.6	45.5 ± 7.5

[1] A fruit and two immediate surrounding young leaves.

(*table I*). In October 2001, significantly higher mean populations of *P. latus* were observed on the Lue Gin Gon and Washington Navel varieties compared with other varieties except Agege, Etinam, Parson Brown and Valencia Late.

There were no significant differences between the percentages of bloom in the 12 varieties assessed (*table I*). There was also no significant ($P > 0.05$) correlation between the populations of mites and the percentages of maximum bloom during the study periods.

3.2. *P. latus* damage during the fruiting seasons

During the 2000 and 2001 fruiting seasons, the number of fruits damaged by the mites in the sweet orange varieties followed the same pattern as the mite population levels recorded on them. In August 2000 and 2001, various levels of fruit damage were observed in the 12 varieties. However, these were not significantly ($P > 0.05$) different from each other. In September 2000, a significantly higher mean number of damaged fruits (3.5) was observed on Agege compared with Carter Navel and Umudike, which had the lowest mean numbers of 0.9 damaged fruits each (*table II*). High numbers of damaged fruits were also observed on Meran, Lue Gin Gon, Pineapple, Valencia Late and Washington Navel, but these were not significantly different from each other. In September 2001, a higher number of damaged fruits was observed in Washington Navel (mean of 3.5), but this was only significantly ($P < 0.05$) higher than those of Carter Navel, Etinam and Hamlin. At fruit maturity, in October 2000 and 2001, further fruit damage was no longer observed.

While the mean numbers of damaged fruits in the 2000 fruiting season were significantly ($P < 0.01$) correlated to mite populations in September ($r = 0.679$; $n = 48$), correlation analyses conducted in the other months were not significant. The numbers of damaged fruits in 2001 were significantly

Table II.
Fruit damage by *Polyphagotarsonemus latus* in twelve sweet orange varieties in the 2000 and 2001 fruiting seasons in Ibadan (Nigeria).

Sweet orange varieties	Mean number of damaged fruits ± standard error per tree[1]									
	June		July		August		September		October	
	2000	2001	2000	2001	2000	2001	2000	2001	2000	2001
Agege	0.5 ± 0.28	0	1.0 ± 0.2	0	1.7 ± 0.7	2.25 ± 0.9	3.5 ± 0.64 a	1.8 ± 0.7 ab	3.5 ± 0.64 a	1.8 ± 0.62 ab
Bende	0	0	0	0	0.5 ± 0.29	0.75 ± 0.25	1.7 ± 0.47 ab	1.8 ± 0.47 ab	1.7 ± 0.75 ab	1.8 ± 0.47 ab
Carter Navel	0	0	0	0	0	0.25 ± 0.2	0.9 ± 0.5 b	1.2 ± 0.2 b	0.9 ± 0.5 b	1.2 ± 0.25 b
Etinam	0	0	0	0	0.5 ± 0.64	0.25 ± 0.25	1.5 ± 0.2 ab	1.2 ± 0.47 b	1.5 ± 0.5 ab	1.2 ± 0.25 b
Hamlin	0	0	0.5 ± 0.2	0	1.2 ± 0.47	0	1.5 ± 0.2 ab	1.0 ± 0 b	1.5 ± 0.2 ab	1.0 ± 0.2 b
Lue Gin Gon	0	0	0	0	1.0 ± 0.2	2.25 ± 0.9	2.5 ± 0.8 ab	1.8 ± 0.75 ab	2.5 ± 0.28 ab	1.8 ± 0.47 ab
Meran	0	0	0	0	0.2 ± 0.2	0.5 ± 0.2	2.9 ± 0.57 ab	1.5 ± 0.2 ab	2.9 ± 0.4 ab	1.5 ± 0.29 ab
Parson Brown	0	0	0.5 ± 0.28	0	0.7 ± 0.47	1.0 ± 0.41	1.9 ± 0.4 ab	1.8 ± 0.47 ab	1.9 ± 0.7 ab	1.8 ± 0.7 ab
Pineapple	0	0	0	0	1.5 ± 0.5	1.0 ± 0	2.9 ± 0.4 ab	1.5 ± 0.29 ab	2.9 ± 0.2 ab	1.5 ± 0.2 ab
Umudike	0	0	0	0	0	0.75 ± 0.47	0.9 ± 0.5 b	1.8 ± 0.47 ab	0.9 ± 0.5 b	1.8 ± 1.0 ab
Valencia Late	0	0	1.0 ± 0.2	0	1.5 ± 0.29	2.0 ± 0.7	2.9 ± 0.2 ab	2.8 ± 0.25 ab	2.9 ± 0.57 ab	2.8 ± 0.25 ab
Washington Navel	0	0	1.0 ± 0	0	1.5 ± 0.29	1.5 ± 0.5	2.5 ± 0.2 ab	3.5 ± 0.28 a	2.5 ± 0.28 ab	3.5 ± 0.64 a

[1] Number damaged out of 10 fruits.

($P < 0.001$) correlated with the populations of mites in September and October (r = 0.602 and r = 0.687, respectively; n = 48).

3.3. Populations of predatory mites in a citrus orchard

Both in 2000 and 2001, populations of the predatory mite *Bdella* sp. (Acarina: Bdellidae) attacking *P. latus* were generally low on the 12 sweet orange varieties. Other observed predatory mites were *Typhlodromalus* spp. (Acarina: Phytoseiidae), *Euseius* sp. (Acarina: Phytoseiidae) and *Zetzellia* sp. (Acarina: Stigmaeidae), but their populations were so low that they were not considered in the population study. There were no significant differences between the populations of the bdellid predatory mites in the 12 sweet orange varieties despite high populations of the latter observed during the months of high *P. latus* population (*table III*).

The populations of predatory mites were positively correlated with those of phytophagous mites in September 2000 (r = 0.559; $P < 0.03$), and October 2001 (r = 0.981; $P < 0.001$).

4. Discussion

The progressive increase in mite population from July to the peak in September suggests the need for initiating control in July when the population is on the verge of increasing. Application of miticides early in the fruiting season will be uneconomical since damage is insignificant during those periods in the study area. Timely application of control will save costs for low-income farmers and minimize the elimination of natural enemies of other citrus pests as well as achieve the desired results.

The higher *P. latus* infestation of some sweet orange varieties compared with others was confirmed by the two years' studies. For example, the observation that Agege, Lue Gin Gong, Valencia Late and Washington Navel were most susceptible to mite attack in the 2000 and 2001 trials suggests that these varieties may have contained certain

Table III.
Populations of predatory mites in twelve sweet orange varieties in the 2000 and 2001 fruiting seasons in Ibadan (Nigeria).

Sweet orange varieties	Mean population ± standard error per sample point[1]									
	June		July		August		September		October	
	2000	2001	2000	2001	2000	2001	2000	2001	2000	2001
Agege	1.0 ± 0.5	1.0 ± 0.25	1.3 ± 0.75	2.7 ± 0.47	1.3 ± 0.47	0	2.0 ± 0.7	3.2 ± 0.47	1.6 ± 0.41	1.3 ± 0.47
Bende	0	0	0	1.3 ± 0.25	0	1.3 ± 0.25	0	2.5 ± 0.64	1.3 ± 0.25	0
Carter Navel	0	0	0	0	0	0	0	1.3 ± 0.47	0	0
Etinam	0	0	0	1.7 ± 0.7	1.0 ± 0	1.3 ± 0.75	2.0 ± 0.7	3.7 ± 0.75	0	0
Hamlin	0	0	0	0	0	1.3 ± 0.47	1.7 ± 0.47	3.2 ± 1.2	0	0.3 ± 0.25
Lue Gin Gon	0.3 ± 0.25	0	1.3 ± 0.94	2.0 ± 0.9	1.3 ± 0.25	1.3 ± 0.25	1.7 ± 0.47	3.5 ± 0.28	1.3 ± 0.94	0
Meran	0	0	1.5 ± 0.5	0	1.0 ± 0.25	0	1.5 ± 0.2	3.0 ± 0.2	1.6 ± 0.5	0
Parson Brown	0	0	1.5 ± 0.2	0	1.3 ± 0.25	0	1.3 ± 0.75	1.5 ± 0.2	0	0
Pineapple	0	0	0	0.3 ± 0.25	1.5 ± 0.5	0	1.3 ± 0.25	2.5 ± 1.0	0	0.6 ± 0.2
Umudike	0	0	0	2.7 ± 0.4	0	.0	0	1.3 ± 0.25	1.6 ±	0
Valencia Late	1.0 ± 0.5	1.0 ± 0.4	1.3 ± 0.47	2.0 ± 0.7	1.3 ± 0.25	1.5 ± 0.2	0	3.5 ± 0.64	1.3 ± 0.75	1.0 ± 0.5
Washington Navel	0	0.3 ± 0.25	1.3 ± 0.47	0	0	1.3 ± 0.25	1.7 ± 0.7	1.3 ± 0.25	1.3 ± 0.47	0.6 ± 0.4

[1] A fruit and two immediate surrounding young leaves.

physicochemical properties that would be more preferred by *P. latus* than properties of other varieties. Other authors have shown that certain physicochemical properties of the fruits such as the essential oils and acidic content of the rind influence their preference by fruit flies [10–12]. The susceptible Agege and Valencia Late varieties are among the most widely cultivated varieties in Nigeria. There is therefore the need to monitor populations of mites in endemic areas planted with these varieties so that control could be applied at the appropriate periods if the population reaches damaging levels. In most cases, damage to fruits increased with an increase in population of mites in the samples. They were also higher in varieties noted to be most susceptible.

Blooming did not influence mite infestation, as the bloom percentages at all the sampling stages were not correlated with the populations of mites; whereas the number of damaged fruits was positively correlated with the population of mites [13]. The presence of newly formed fruits themselves may have acted as a major influence for infestations. The frequency of the rains tends to diminish towards harvest period and may have contributed to the increased population observed in September and October. Moisture reduction was noted as being one of the major factors promoting mite infestations [14, 15]. Sampling was discontinued in November when the fruits were mature and harvesting was initiated.

Not many natural enemies were observed attacking the mites. However, predatory mites of the Bdellidae family were most prominent, though at low populations, and were observed preying on *P. latus* in 2000 and 2001. These predatory mites are also known to attack various species of mites [16]. Predatory mite population per sample point also fluctuated positively with the population of mite pests across the twelve sweet orange varieties, although the relationship was only significant in the months of August 2000 and September 2001.

5. Conclusions

Our study shows that, despite the nature of *P. latus* infestation of sweet oranges, their damage significantly affects the marketable fruit yield of some varieties more than others. Since population increases as the dry season approaches (September and October) in Southwestern Nigeria, it is recommended that control be initiated from July. Furthermore, production practices that favor the increase in predatory mite populations, such as avoidance of the use of broad-spectrum pesticides, will reduce the population of *P. latus*.

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Estragos de *Polyphagotarsonemus latus* en la producción de naranjas del suroeste nigeriano y estudio de sus parasitoides.

Resumen – **Introducción**. Las cicatrices y los defectos hacen que los frutos cítricos no sean válidos para la venta local y para el mercado de exportación. Con el fin de mejorar esta situación, se evaluaron en un vergel del instituto de investigación hortícola nacional nigeriano (NIHORT), en Ibadán, Nigeria, las poblaciones del ácaro fitófago *P. latus* Banks (uno de los agentes del origen de los estragos observados), durante las estaciones de producción del 2000 y del 2001. Paralelamente se estudiaron los daños causados a los frutos de 12 variedades locales del naranjo. El objetivo de nuestro estudio fue identificar los mejores periodos de control del ácaro; y, de evaluar la sensibilidad de diferentes variedades del naranjo frente al ataque del insecto. **Material y métodos**. Se emplearon para nuestro estudio doce variedades de naranja dulce colocadas según un dispositivo de bloques completos aleatorizados, con cuatro réplicas. Se hizo un muestreo por réplica de un representante de cada variedad para evaluar la población del fitófago y sus daños consecuentes. **Resultados y discusión**. Las poblaciones del ácaro, así como sus daños consecuentes en las diversas variedades de naranja dulce, aumentaron hasta la madurez del fruto. Las variedades Agege, Lue Gin Gong, Valencia late y Washington navel, fueron las más sensibles respecto al ataque del parásito; y sus frutos sufrieron daños más altos que aquellos registrados para las otras variedades. Las poblaciones de parasitoides predominantes (familia Bdellidae) que atacaron a *P. latus* fueron significativamente ($P < 0.05$) correlacionadas con su presa en los periodos de fuerte población. Destacaron los efectos nefastos del abuso de pesticida en los enemigos naturales del parásito. **Conclusión**. El aumento progresivo de la población del devastador sugiere que se lleve a cabo un control del fitófago en julio antes que alcance su pico de población observado en septiembre en Nigeria.

Nigeria / *Citrus sinensis* / ensayos de variedades / frutas / *Polyphagotarsonemus latus* / ácaros nocivos / control de plagas