

IMPACT OF THE ENTOMOPHAGOUS FAUNA ON THE *Parlatoria Blanchardii* TARG POPULATION IN THE BISKRA REGION

Part 1

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Abstract : *Date palm tree is facing many problems and constraints such as water stress, excess of salinity, diseases, pests, etc... Among the most important pests Parlatoria blanchardii communly known as the white cochineal is spread in Biskra region. Aims of this study were to measure its spread, to identify its natural predators and to measure there impact on this pest. Ipert's scale was used to measure overrun of Parlatoria blanchardii on date palms. Most predators of this pest living in the study area were identified and there impact measured. Results show that spread of Parlatoria blanchardii is not uniform all over the study area. More over a close relationship was found between it's spread and those of predators such as, Cybocephalus palmanum and Pharoscymus semiglobus.*

Key words : *Date palm tree, White cochineal, Spread, Predators, Ipert scale.*

Résumé : *Le palmier dattier est confronté à de nombreux problèmes et contraintes tels que le déficit hydrique, les excès de salinité, les maladies, les insectes nuisibles, etc... Parmi ces derniers, Parlatoria blanchardii Targ communément appelée la Cochenille blanche est répandue au niveau de la région de Biskra. Les objectifs de cette étude visent une évaluation de l'infestation des palmeraies de la wilaya de Biskra par la Cochenille blanche, l'identification de ses prédateurs naturels et leur impact. L'échelle d'Ipert a été utilisée pour mesurer les taux d'infestation par Parlatoria blanchardii. La plupart des prédateurs existants dans la zone d'étude ont été identifiés et leur impact sur la population de Parlatoria blanchardii a été mesuré. Les résultats ont montré que l'infestation par Parlatoria blanchardii n'est pas uniforme sur l'ensemble de la zone étude. Par ailleurs, il a été trouvé une étroite corrélation entre les populations de Parlatoria blanchardii et de la faune prédatrice telle que Cybocephalus palmanum et Pharoscymus semiglobus.*

Mots clés : *Palmier dattier, Cochenille blanche, Infestation, Prédateurs, Echelle d'Ipert.*

INTRODUCTION

Date palm tree is facing many problems and constraints that have without any doubt negative impacts on its normal growth and production.

Problems such as water stress, excess of salinity arid and lack of drainage are making up an ideal biotope for a spreading and an increase of many diseases and pests. Among the latest *Parlatoria blanchardii* commonly known as the white cochineal seems to be one of the most widespread in the Biskra region.

Factors such as lack of treatment, inefficiency and high cost of chemical products, reproduction speed of *Parlatoria blanchardii*, that is four generations year (Toutain, 1972) seem to be the main causes of the infestation of the study area.

However, it is widely accepted that *Parlatoria blanchardii* population can be decreased by the impact of some predators. Balachowsky (1936) reported that *Parlatoria blanchardii* has been jugulated by two main predators : *Cybocephalus palmarum* and *Pharoscymus anchorago*. Iperty and al (1970), showed the impact of some natural predators mainly *Chilochorus bipustulatus* on *Parlatoria blanchardii*.

Informations outlined in most references demonstrate that if the white cochineal is living with its natural predators, it should be easy to control its population growth and damages caused on palm trees could be maintained at an acceptable level.

To reach such aim, it is necessary :

- 1- to monitor the extent of the damage caused by *Parlatoria blanchardii* on the palm trees of the Biskra region,
- 2- to draw a map of the infested area,
- 3- to have an exhaustive list of all entomophagous fauna in the study area,
- 4- to study the relation between *Parlatoria blanchardii* and its predators,
- 5- to appreciate the real impact of the entomophagous fauna as a natural predator of *Parlatoria blanchardii*.

This research work has been divided in two parts and started on the 5 th April 1997. The first part deals mostly with an understanding of :

- the extend of the infestation.
- the relationship between *Parlatoria blanchardii* and its predators.

MATERIEL AND METHODS :

Seventeen (17) districts among the 33 that make up the Biskra region (Wilaya) were selected for this study. These are most representative districts in terms of palm trees populations (table I).

Tab. I : Total Palm trees population in the Biskra region. (unpublished data).

DISTRICTS	TOTAL PALM TREES	SELECTED DISTRICTS(*)
01 Biskra	140 995	
02 El Hadjeb	116 739	*
03 El Outaya	9 886	
04 El Kantara	16 500	*
05 Ain Zaatout	4 000	
06 Djemorah	10 230	
07 Branis	20 875	
08 Sidi Okba	213 100	*
09 Ain Naga(Ain Deba)	32 777	*
10 El Haouch	72 302	*
11 Chetma	72 800	*
12 Mchouneche	83 000	
13 Zeribet El Oued	7 690	
14 M'ziraa	10 800	
15 El Feidh	20 950	
16 Khangat S. Nadji	21 700	
17 Tolga (Magtoufa)	209 000	*
18 Bordj B. Azzouz	124 749	
19 Lichana	74 900	*
20 Bouchagroune	61 000	*
21 Foughala	104 600	
22 Laghrous	85 600	*
23 Ourlal (Saada)	110 168	*
24 Mekhadma	96 848	*
25 Lioua	155 520	*
26 Mlili	109 351	*
27 Oumache	106 011	*
28 Ouled Djellal	166 500	*
29 Doucen	52 300	
30 Chaiba	1 860	
31 Sidi Khaled	82 000	*
32 Besbes	00000	
33 Ras El Miad	00000	
T O T A L	2 394 748	

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Using the Iperi scale, a map showing the degree of infestation was drawn.

In each of the seventeen selected districts, five oases were chosen for this study, using criteria such as :

- the most infested oasis (visually estimated),
- homogeneity of the palm trees population in the selected oasis (same variety).

In each oasis, five palm trees were taken at random. From each palm tree, 12 palm leaves were cut and taken back to the laboratory, these were selected according to their orientation i.e. (N.E.S.W.). Three cuttings measuring 30 to 40 cm per palm leaf were used for counting. All living individuals on one cm were taken into account. Empty folicules were disregarded. Twenty five thousand countings were carried out in this analysis.

All entomophagous species found in one leaf taken at random from one palm

tree in the studied oasis were recorded, identified and used in the analysis for the relationship between the predatory fauna and the white cochineal.

RESULTS AND DISCUSSIONS

Levels of infestation in the study area :

Levels of infestation of palm trees by *Parlatoria blanchardii* in the study area are shown in table II. Three main levels were observed according to the Iperi scale (1987) :

- High level : 2 - Six districts
- Medium level : 1 - Five districts
- Low level : 0.5 - Six districts

In each leaf it was found that living individuals of white cochineal varied from 5 individuals to more than 100 per cm.

Table II : Mean levels of infestation by *Parlatoria blanchardii* in the 17 districts of the study area.

DISTRICTS	WHITE COCHINEAL / CM	LEVELS OF INFESTATION(*)
01 Sidi Okba	101	2
02 Ourial (Saada)	128	2
03 El Haouch	117	2
04 Oumache	112	2
05 Ain Naga(Ain Deba)	125	2
06 Chetma	126	2
07 Bouchagroune	58	1
08 El Hadjeb	51	1
09 Lichana	47	1
10 Laghrous	38	1
11 Tolga (Magtoufa)	59	1
12 Ouled Djellal	12	0.5
13 Sidi Khaled	13	0.5
14 Lioua	5	0.5
15 Mekhadma	15	0.5
16 Mili	8	0.5
17 El Kantara	10	0.5

(*) Iperi scale

Highest levels of infestation were observed either in the oasis with the most important density of palm trees, i.e. the highest number of palm trees per hectare (Table III) or in those with the oldest palm trees that could be found in the Biskra region (Figure 1).

Our observations revealed also that shaded oasis with high levels of moisture seem to have favoured an increase of the white cochineal population. Munier (1973) reported that *Parlatoria blanchardii* prefers shaded sites with high hygrometric levels.

Table III : Number of Palm trees per hectare in the Biskra region (BNEDER, 1992).

DISTRICTS	NUMBER OF PALM TREES/ HA	SELECTED DISTRICTS(*)
01 Biskra	131	
02 El Hadjeb	111	•
03 El Outaya	130	
04 El Kanlara	120	•
05 In Zaalout	118	
06 Djemorah	59	
07 Branis	130	
08 Sidi Okba	122	•
09 Ain Naga (Ain Deba)	61	•
10 El Haouch	90	•
11 Chelma	140	•
12 M'Chouneche	128	
13 Zeribet El Oued	100	
14 Mziraa	140	
15 El Feidh	128	
16 Khangal Sidi Nadji	128	
17 Tolga (Magloufa)	123	•
18 Bordj Ben Azzouz	134	
19 Lichana	92	•
20 Bouchagroune	119	•
21 Foughala	123	
22 Laghrous	120	•
23 Ourlal (Saada)	120	•
24 Mekhadma	117	•
25 Lioua	117	•
26 Milili	138	•
27 Oumache	101	•
28 Ouled Djellal	63	•
29 Doucen	102	
30 Chaiba	20	
31 Sidi Khaled	63	•
32 Besbes	0	
33 Ras El Miad	0	

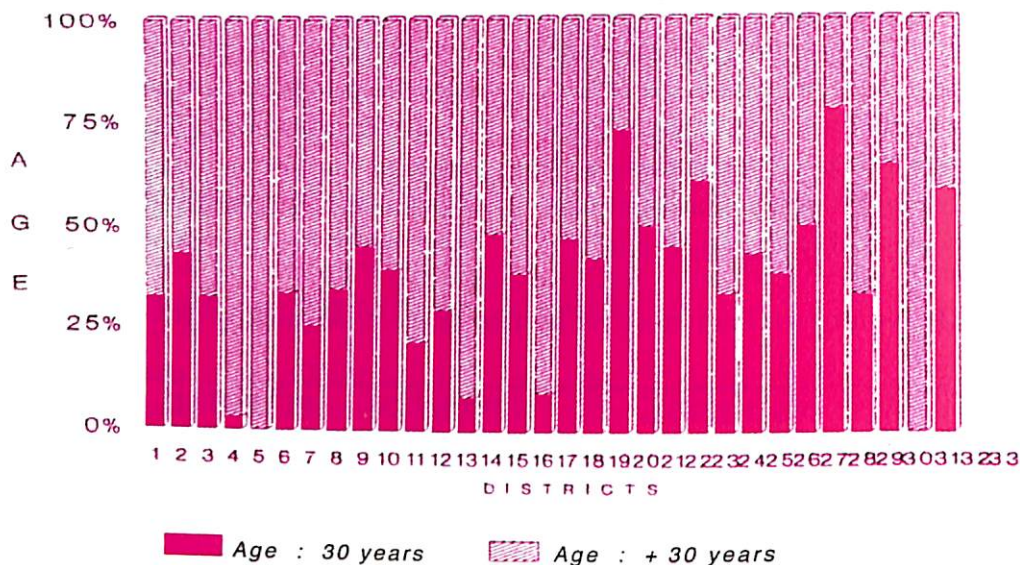


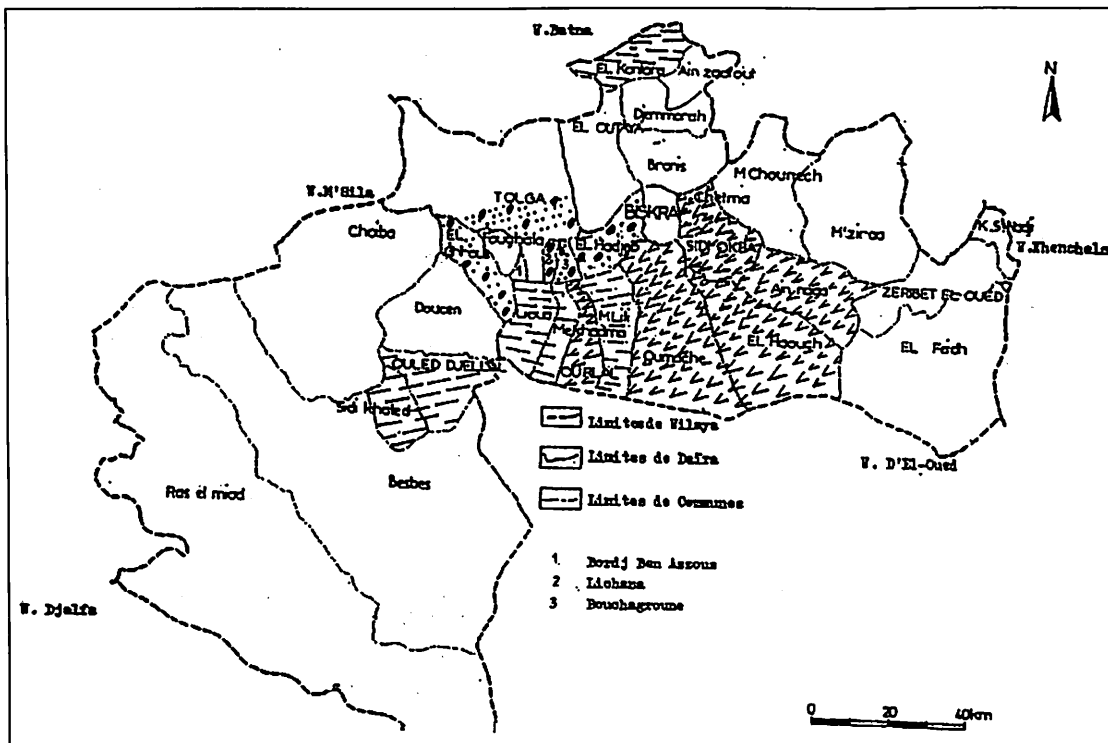
Figure 1 : % Age structure of palm trees in the Biskra region
(Number 1 to 33 indicate the 33 districts : see Table I).

Infestation map :

Results outlined above in table II were used to draw the infestation map of Biskra region (Figure 2). This map shows very clearly that the pattern of the infestation decreases from east to west. The most infested oasis were located in the south east districts. Beyond the fact that in these districts the oldest and less productive palm trees could be found, highest levels of

air moisture are recorded throughout the year in this area.

Further more, we noticed that the most infested oasis were invaded by many species of weeds. It has been supposed that these weeds could host the white cochineal. Bodenheimer (1944), reported that beyond the palm tree, many others plants could host *Parlatoria blanchardii*.



Entomophagous fauna and its impact on Parlatoria blanchardii :

Table IV : Recorded adult individuals of *Cybocephalus palmarum* and *Pharoscymus semiglobus* in one leaf taken from one palm tree in each of the surveyed Oasis.

SURVEYED DISTRICTS	NUMBER OF PREDATORS (*)
01 Sidi Okba	8
02 Ourlal (Saâda)	7
03 El Haouch	6
04 Oumache	6
05 Aïn Naga (Aïn Deba)	9
06 Chetma	6
07 Bouchagroune	12
08 El Hadjeb	14
09 Lichana	13
10 Laghrous	12
11 Tolga (Magtoufa)	10
12 Ouled Djellal	15
13 Sidi Khaled	12
14 Lioua	11
15 Mekhadma	15
16 Mlilli	13
17 El Kantara	14

(*) Iperti scale

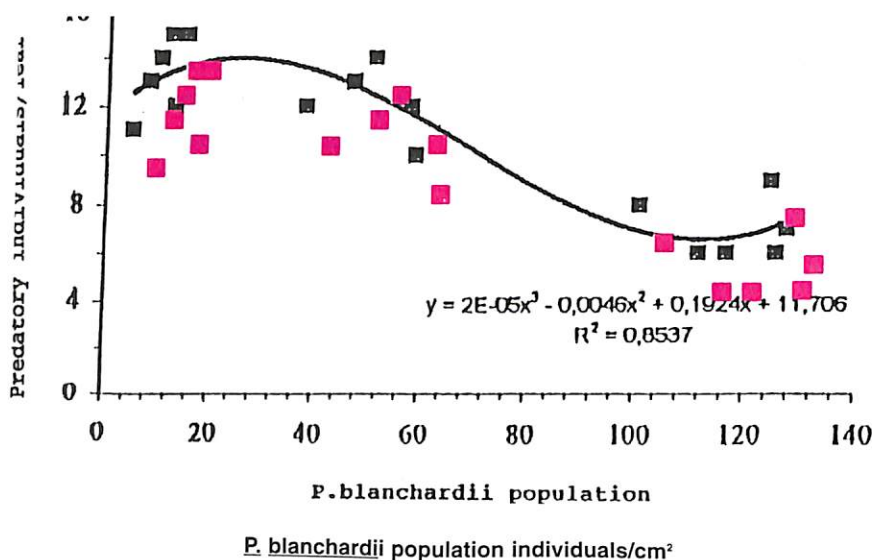


Figure 3 : Regression line for the number of Predatory individuals /leaf on *P.blanchardii* population/cm

CONCLUSION AND SUGGESTIONS FOR FUTURE RESEARCH

Of many solutions that have been put forward to control and/or eradicate *Parlatoria blanchardii*, it is obvious that the most indicated seems to be the biological mean Balachowski (1929), Hoceini (1977) reported that the white cochineal population could be easily controlled by natural predators. However, it is also clearly stated that the choice of one or another of the many predators of *Parlatoria blanchardii* Targ has to be very accurate. Ipertti and al (1970) showed that of the four entomophagous species introduced in Mauritania, only *Chilochurus bipustulatus iranensis* gave satisfactory results.

Beyond the fact that in the Biskra region, we found that a predatory fauna able to jugulate the white cochineal is already present, the study revealed also that among the entomophagous individuals found in the area, *Cybocephalus palmarum* and *Pharoscymus semiglobus* are the most efficient. Their impact on *Parlatoria blanchardii* is related to their number. The lowest level of infestation were recorded were up to 15 predators could be found in one leaf.

Part II of this work will be consacrated to know more accurately the required number of the two species that could eradicate or at least control *Parlatoria blanchardii* in the Biskra region. Another aspect of the future work will be dealing with the possible ways to relocate some individuals of the predatory fauna in the south east of the study area.

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