LEAF-CUTTING ANTS (ATTA SP.), DAMAGE TO AND DISTRIBUTION ALONG BRAZILIAN ROADS

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SUMMARY

Studies were conducted with the objectives of determining the number and probable damage from the colonies of «saúvas» in the zones adjacent to Brazilian highways. Two regions were investigated : the first was a highly populated area of Minas Gerais ; the second was located in an area of low population in untouched woodlands of Pará. In the first area the average number of nests per km was 63.3 and they belonged to *Atta sexdens rubropilosa, A. laevigata* and *A. bisphaerica*. In the second region, the average number of nests per km was 17.3 (the species of *Atta* were not determined).

Reference was made to the fact that *Atta* spp. follow mankind in the «ways of colonization». Also mentioned is their «potential» for soil removal from the subsurface layers in the highway margins. Finally, systematic control of these ants along highways is recommended.

RESUMEN

Las hormigas defoliadoras (Atta sp.), el daño que causan a las carreteras brasileras y la distribución que tienen a lo largo de ellas

Varios estudios fueron realizados con el objetivo de determinar el número y los daños posibles de las colonias de Sauvas en las zonas que bordean las grandes carreteras brasileñas. Dos regiones fueron investigadas : la primera es un área altamente poblada en

el estado de Minas Gerais ; la segunda está localizada en un área poco poblada de las selvas intactas en el estado de Pará. En el primer área el promedio de nido por km fué de 63.3, perteneciendo a *Atta sexdens rubrapilosa, A. laevigata* y *A. bisphaerica.* En la segunda región, el promedio de nidos por km fué de 17.3 (las especies de *Atta* no fueron determinadas).

Las especies de *Atta* siguen al ser humano en sus caminos de colonización. También se menciona su potential para remover el suelo de la superficie a los lados de las carreteras principales. Finalmente se recomienda un control sistemático de esas hormigas a lo largo de las carreteras principales.

INTRODUCTION

Of the 14 species of leaf-cutting ants which exist in the American continent, 9 are found in Brazil and one of these has 3 sub-species. These fungus-eating ants are widespread in the whole territory. Their damage to crops is well-krown in Brazil and abroad. Wilson (1971) cites the «sauvas» as the «Kings of Brazil» and Brazil as a «big nest of ants».

Considering the different species of these ants and the great losses from them to crops and native vegetation they can be considered as the «major pest of Brazilian agriculture».

The species of «sauvas» were studied by Autuori (1941, 1942a, 1942b, 1947, 1949, 1950e, 1956a, 1956b) and Gonçalves (1945, 1951, 1960), among others. Literature on the losses to man made constructions due to these ants is scarce. Only Nogueira (1975) tried to quantify such losses.

MATERIAL AND METHODS

Areas along two Brazilian highways were tested : the first was located in a well urbanized area in the state of Minas Gerais and the second was in an area of extremely low population in the State of Para. In Minas Gerais the area tested was on Highway BR 120 between the cities of Viçosa and Ponte Nova, involving 46 km. In Para, the tests were conducted on the Transamazônica Highway, between Altamira and Itaituba : the length of the area was 45 km.

On the first highway one km out of every 5 km was surveyed completely and the ant nests were counted, regardless of their size, on each side of the road, between the road and the limiting fences. Two zones were recognized : road cuts (close to the road shoulders) and from the road shoulders to the fences.

The nests of the three ant species which occur in the Viçosa region were counted : *Atta sexdens rubropilosa* («sauva limao») *Atta laevigata* («sauva cabeça de vidro») and *Atta bisphaerica* («sauva mata-pasto»). The survey was made in the period September 4-10, 1974.

The same procedure was used in the second area, i.e, a survey was made every 5 km. One kilometer along the road for 5 m on each side of the road due to the difficulties of deeper penetration because plant regeneration along the Transamazônica is spectacular. In the counts of the number of ant nests the size of their areas were considered, as shown in Table I. This survey was made on October 17, 1975.

Table I – Nest classification of *Atta* spp by area (obtained by multiplying their greatest length by their greatest width).

Tabla I – Classificación de los nidos de *Atta* spp por área.

Classification	Size of the area
Small	smaller than 15 m^2
Medium	from 15 to 25 m^2
Big	greater than 25 m^2

RESULTS AND DISCUSSION

First region :

The result for this region are presented on Table 2.

Table II – Nest number of *Atta sexdens rubropilosa, Atta laevigata* and *Atta bisphaerica* per km, of road shoulders. Data from 7 observations along the BR - 120 highway (Viçosa - Ponte Nova), Minas Gerais, Brasil.

Tabla II – Número de nidos de *Atta sexdens rubropilosa, Atta laevigata* y *Atta bisphaerica* por km de borde de carretera. Datos de 7 observaciones a la largo de la carretera BR - 120 (Viçosa - Ponte Nova), Minas Gerais, Brasil.

		Number of nests / 3 species	
Km	Road shoulder	Right of way	Total / km
10	55	4	59
15	66	14	80
20	66	24	90
25	57	13	70
30	35	13	48
35	31	17	48
40	35	13	48
Total / area	345	98	

Variance analysis of total numbers in the two zones showed highly significant differences between them. In terms of percentage, it means 77.9 % of the nests were along the highway margins and 22.1 % away from the edge of the road.

During their normal growth these ant nests can cause severe damage to the paved roads. This damage is produced by the removal of soil below the surface by the ants. The damage is in the form of lowering and crunching of the roads which facilitates water penetration. That the soil removal can be of great potential is evident if we consider that the general average is 63.3 nests/km and of these 19.28/km occur very close to the margins of the roads.

According to Autuori (1947) 22.720 m^3 of loose soil was removed from a nest 6 years and 3 months of age. The loose soil that was occasionally carried away by wind or rainfall was not taken into account. It can be readily observed that in the 46 kilometers between the cities and, considering only the road shoulder, there is a «potential» soil removal of 46.000 m^3. This figure could become higher if it is considered that the life of a «sauva» nest can be over 14 years, as observed by Autuori (1947) in a similar study.

Second region :

Table III – Nest number of *Atta* spp/km classified in 3 sizes, within 5 m of road shoulders. Data from 9 observations. Transamazônica Highway, Altamira - Itaituba, Para, Brazil.

Tabla III – Número de nidos de *Atta* sp./km, clasificados entre 3 tamaños dentro de una franja de 5m al borde de la carretera. Datos desde 9 observaciones. Transamazôna, Altamira Itaituba, Para, Brasil.

Km	Number of nests/Classification/Area			Total/Km
	Big 25 m^2	Medium 15 à 25 m^2	Small 15 m^2	
4-5	5	5	70	80
9-10	2	2	60	64
14-15	0	0	0	0
19-20	2	0	20	22
24-25	0	0	5	5
29-30	0	0	0	0
34-35	0	1	1	2
39-40	0	0	0	0
44-45	0	0	0	0
Total	9	8	156	173

The great majority of nests are of small size. The probable reason for this is the age of the road ; the Transamazônica highway had been completed for less than 3 years at the time of the survey. It is also observed that there are 2 peaks of nest concentration : kilometers 4 and 19. Such concentrations can always be seen in areas close to human concentrations.

In the first 10 km of the road, colonization, forest cutting and farms already existed. At km 19 the first school was created ; therefore man is present there.

The tendency of ants to follow man has already been mentioned by some authors. Gonçalves (1970) mentions it for *Atta sexdens* in Forest areas of Parana. He goes on to say that «the species was invading the areas following the trail of colonization». In the present study the presence of a few colonies of «sauvas» in places far from human concentrations, along open roads, in virgin forests, where the number of natural enemies is very high was verified. This low number of ant colonies was observed even 3 years after opening of the highway. The aim next year is to make another survey in order to follow the charges in size and number of colonies during the last 5 years period .

CONCLUSION

The existence of a very great «potential» for the soil removal from the subsurface layers next to highway margins by the «sauva» ants (*Atta* sp.) is verified. This is due to the normal growth of colonies along the highways. In the first region studied the average number of colonies was 63.28/km while in the second the figure was 17.33/km, this being a recently opened road.

The «sauva» nests should be considered as a biological hazard to the Brazilian highways and should be taken into account in the building of new roads. Systematic control on the roads already existing is recommended.

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