

Occurrence of *Cinara* spp. (Hemiptera, Aphididae) on *Pinus* spp. (Pinaceae), in the county of Lages-SC, Brazil¹

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ABSTRACT. A population survey of the giant conifer aphid *Cinara* spp. was carried out in two areas of *Pinus elliottii* using yellow pan traps, during two years, from July 1997 to June 1999. During the collection period, the predominant species was *Cinara pinivora* (Wilson, 1919), representing 99% of the collected species. A few specimens of *Cinara maritimae* (Dufour, 1833) and only one winged female of *Cinara fresai* Blanchard, 1939 were collected. The population of *C. pinivora* was statistically higher in the area with 4.5 year-old trees than in the 1.5 year-old ones. The highest population peaks were registered in July 1997 and in August 1998. An unexpected high number of winged parthenogenetic females was collected in December 1998. *C. fresai* Blanchard, 1939 is recorded for the first time for Brazil.

KEYWORDS. Faunistics; giant conifer aphids; insect survey; yellow pan traps.

RESUMO. Ocorrência de *Cinara* spp. (Hemiptera, Aphididae) em *Pinus* spp. (Pinaceae), em Lages-SC, Brasil O levantamento populacional do pulgão-gigante-do-pinus, *Cinara* spp. foi desenvolvido em duas áreas de plantio de *Pinus elliottii* utilizando armadilhas-amarelas-de-água, durante dois anos, de julho de 1997 a junho de 1999. Durante o período de coletas, a espécie predominante foi *Cinara pinivora* (Wilson, 1919), representando 99% de todas as espécies coletadas. Alguns espécimes de *Cinara maritimae* (Dufour, 1833) e apenas uma fêmea alada de *Cinara fresai* Blanchard, 1939 foram coletados, sendo este o primeiro registro de *C. fresai* no Brasil. A população de *C. pinivora* foi estatisticamente superior na área com árvores de 4,5 anos em relação à de 2,5 anos de idade. Os picos populacionais foram registrados em julho de 1997 e em agosto de 1998. Um inesperado número de fêmeas partenogenéticas aladas foi coletado em dezembro de 1998.

PALAVRAS-CHAVE. Armadilha-amarela-de-água; faunística; levantamento de insetos; pulgão-gigante-do-pinus.

In the last decades there has been, in Brazil, a fast increment in the areas reforested with species of *Pinus*, introduced mainly from the United States of America and Australia. It was due to a Brazilian program to support both forestation and reforestation, effective from 1966 to 1987, in order to reduce pressure on native forests and to supply the material needed for paper, cellulose and wood industries (SHIMIZU 1986). From the approximately five million hectares of reforestation, in Brazil, about two million hectares are composed mainly of *Pinus elliottii* L. and *P. taeda* Englem, in the Southern and Southeastern regions of the country (OLIVEIRA & AHRENS 1987; PENTEADO 1995).

The environmental unbalance, resultant of extensive monoculture areas and other inadequate forestry practices, has been turning the plantations more and more susceptible to the attack of pests and diseases. In 1996, aphids of the species *Cinara pinivora* (Wilson, 1919) (Lachninae, Cinarini) were detected causing severe damages on *Pinus* trees, in the counties of Cambará do Sul (RS) and Lages (SC), in Southern Brazil, particularly during the winter (PENTEADO *et al.* 2000). In 1998, another species, *Cinara atlantica* (Wilson, 1919) was

detected presenting larger geographical and seasonal distribution than that of *C. pinivora*.

Only three species of *Cinara* had been registered until 1993 in Brazil: *Cinara* (*Cinarella*) *maritimae* (Dufour, 1833) on *Pinus elliottii*, *P. densiflora*, *P. thumbergii*, and on *P. caribae bahamensis*; *Cinara* (*Cinarella*) *piniformosana* (Takahashi, 1923), on *P. densiflora*, *P. thumbergii* and *Pinus* spp.; *Cinara* (*Cupressobium*) *tujafilina* (del Guercio, 1909), on *Cupressus* (COSTA *et al.* 1993). According to these authors, a fourth species, *Cinara* (*Cupressobium*) *fresai* Blanchard, 1939, widespread in Argentina, Chile and Colombia, is probably present in Brazil, but it was not collected so far.

The genus *Cinara* is composed of about 200 species that occur on conifers distributed around the world (BLACKMAN & EASTOP 1984). The attacked trees have their development retarded, needle shedding, branch twisting and abundant production of honeydew that favors sooty mold development, affecting photosynthesis (PENTEADO *et al.* 2000). Forest pests such as the giant conifer aphids are difficult to be controlled by conventional insecticide applications.

According to PATTI & FOX (1981), the damages are more

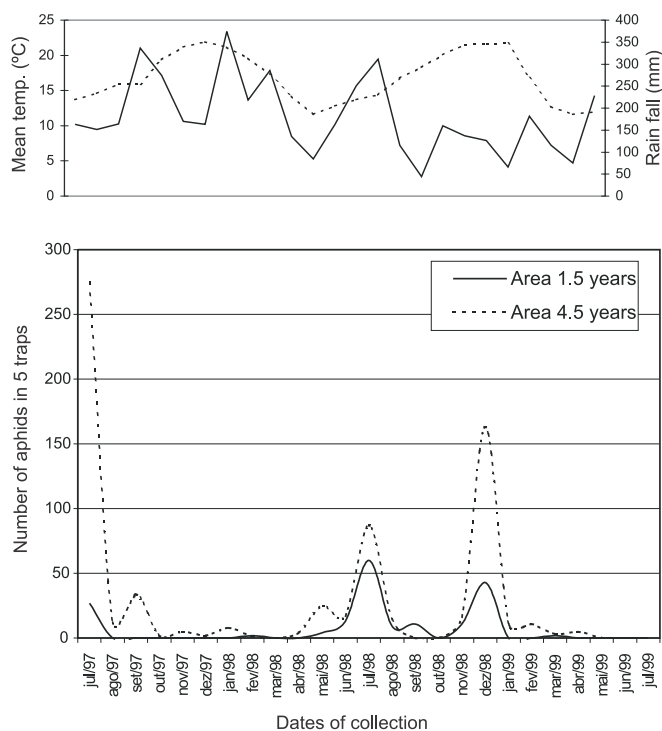


Fig. 1. Number of collected specimens of *Cinara* spp. and climatic data (mean temperature— and precipitation - - -) in two areas of *Pinus elliottii*, in Lages-SC, July 1997 to July 1999.

intense on young trees. FOX & GRIFFITH (1977), working with two year-old *P. taeda* infested by *C. atlantica* in South Carolina, observed significant reduction in diameter and height of infested trees by the end of the third year. ZALESKI (2003) also observed high reduction in growth of pine seedlings exposed to different infestation levels of *C. atlantica* in a greenhouse.

The objective of this research was to determine the influence of temperature and rainfall on the occurrence of *Cinara* species, and to evaluate their presence on areas of *Pinus* with different ages, in order to provide information for biological control programs.

MATERIAL AND METHODS

The collection was accomplished every fifteen days, for a two-year period, from July 1997 to June 1999, in two areas of *P. elliottii*, one with 1.5 year-old trees and the other with 4.5 year-old trees, at the beginning of the collections, in the county of Lages, in the state of Santa Catarina, Brazil. Each area had approximately 80 ha of *Pinus*, with space of 2 x 2.5 m, with 2000 trees/ha; the trees were pruned and the areas cleaned periodically. Five yellow pan traps (Möericke type) were distributed in 1 ha of each area, one at the center and one at each corner, placed on 1.30 m height wood supports. The aphids were removed from the traps with a fine brush and placed in vials with 70% ethanol, then taken to the laboratory for screening and identification of the material. Temperature

and precipitation data were registered by the Estação Agrometeorológica de Lages, nearby the experimental areas.

RESULTS AND DISCUSSION

During the two years of collections, the predominant species in both areas was *C. pinivora*, with 1216 specimens, representing 99% of the *Cinara* specimens collected with the traps. The other species of *Cinara* were 11 nymphs and two winged females of *C. maritimae* and a winged female of *C. fresai*, which was registered in May of 1999. COSTA *et al.* (1993) mentioned that *C. fresai* was probably present in Brazil because it occurs in Argentina, Chile and Colombia, but it had not been collected until now. Thus, this is the first record of *C. fresai* in Brazil.

The number of *C. pinivora* collected was statistically higher (1035 specimens) in the 4.5 year-old trees area than the number (181) collected by the traps in the 1.5 year-old trees area. The highest population peak was in July 1997 (Fig. 1), then the population decreased to insignificant numbers for the next months, and increased again only on August 1998. On December 1998, a high number of parthenogenetic winged females were collected. This was quite unusual because this species was restricted to the winter months and in cooler geographical areas (PENTEADO *et al.* 2000). It has been demonstrated that outbreaks are usually recorded when an exotic pest is introduced into a new area because natural enemies may not be present to control such pest (WALLNER 1996).

Despite the much lower number of aphids in the 1.5 year old trees when compared to the 4.5 year old trees, the populational patterns were very similar.

It can be noticed that there is an inverse correlation between *C. pinivora* collections by the traps and temperature; they are usually higher during the winter, despite the unusual peak registered once during the summer. It was observed (Wilson Reis Filho, personal communication) that *Cinara* specimens go down to the roots and to ant nests during the summer months.

Recent *Cinara* surveys on *Pinus* trees by using yellow pan traps have shown that *C. pinivora* is occurring in very low numbers and is being replaced by *C. atlantica*, which populations are higher and more widespread than the former species (Edson T. Iede, personal communication). These findings are very useful to follow the patterns of these pine aphids and to add information for biological control programs.

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