

COMUNICAÇÃO CIENTÍFICA

IMPROVED METHODS FOR OBTAINING SPITTLEBUG NYMPHS AND EXPECTED YIELDS

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RESUMO

Método simplificado para a obtenção de ninfas de cigarrinhas das pastagens e estimativa da produção.

Elevados números de ninfas de cigarrinhas das pastagens são necessários para estudos de resistência de plantas, determinação da eficiência de patógenos e para vários estudos ecológicos. Estes insetos não são facilmente criados, e não há disponibilidade de uma dieta artificial para sua manutenção.

Este trabalho descreve um método de criação da cigarrinha das pastagens *Zulia entreciana* (Berg) que evita a manipulação dos ovos, e apresenta outro para a obtenção de ninfas em tre agosto e outubro, quando não existem adultos nas pastagens.

A produção de ninfas variou de uma a três para cada adulto utilizado, e entre 30% e 60% das ninfas obtidas por este método atingiram o estágio adulto.

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INTRODUCTION

A fairly large number of spittlebug nymphs are required for studies of host plant resistance, determination of efficacy of microbial agents and for various ecological studies. These insects are not easy to rear and an artificial diet for rearing is not available.

Presently, spittlebugs are reared entirely on grass plants. Eggs are obtained by caging adults over an egg laying media along with grass plants for food. The insects oviposit on the filter paper (MAGALHÃES & SILVA, 1980; STORÓPOLI NETO *et alii*, 1984) or on a mixture of cooked agar and zinc sulphate (NAVES 1980). The eggs are then held on filter paper inside a petri dish and the paper is moistened with water periodically to maintain a high relative humidity. Pieces of grass leaves and stems kept inside the dish serve as food and facilitate removal of newly emerged nymphs. Periodic opening of dishes for watering and introduction of the plant material often results in development of fungus and subsequent reduction in the nymphal yield. Also nymphs are often trapped under the filter paper or on the moisture droplets accumulated on the glass.

A method for obtaining spittlebug nymphs that excludes egg handling is given below. A plastic dish 30 cm diam. x 3cm deep is filled with fine soil and about 150 seeds of *Brachiaria decumbens* Stapf cv. Basilisk are well distributed in the dish and are covered with soil which is compacted lightly. A glass bottle 4 cm diam. x 10 cm tall containing water and about 30 fresh stems of *B. decumbens* is placed in the center of the dish. The dish prepared in this manner is placed in a 35 x 35 x 60 cm tall saran covered cage. About 80 spittlebug adults of *Zulia entreriana* (Berg, 1879) collected from pasture using a sweep-net are released inside the cage which is held in shade. Most of the adults die within 2-3 days. Thereafter, the dish is removed from the cage, the dead adults, discarded and the bottle removed. The dish is then held in a screenhouse and water is sprinkled over the dish as needed. Seedlings of *B. decumbens* emerge in 4-6 days and are about 8 cm tall when the eggs in the dish begin to hatch. The nymphs readily establish themselves on the seedlings. The seedlings with nymphs can be easily pulled from the soil. The nymphs are counted and the clipped portion of the seedling containing nymphs is placed on the soil surface in contact with the test plant. As the clipped seedling begins to dry, the nymphs seek a new food source and try to establish on the test plant. In this manner, a desired number of nymphs can be transferred with the least disturbance. By daily removal of seedlings containing nymphs, one can obtain ≤ 1 day old nymphs. Thirty to 60% of such nymphs transferred to *B. decumbens* plants reached adulthood (NILAKHE & PASCHOAL, 1985).

The number of nymphs obtained using the method described above varied from one to three per caged adult. Similar results could be obtained by placing 4 to 5 dishes in a lar-

ger cage and increasing the adult numbers proportionately. Clearly, the nymphal yield will depend upon adult sex ratio, survival of adults, their physiological status, the number of eggs laid and the egg hatch. Checking the sex ratio of the caged adults is particularly important. At times a sex ratio of 90:10 in favor of males was obtained among the adults collected by sweeping. Caging adults from such a lot would give very poor nymphal yield. Using the method described here, several thousand nymphs were obtained for used in host plant resistance research over a 4-year period.

In the state of Mato Grosso do Sul, the majority of spittlebug eggs deposited in the latter part of April and May do not hatch until the next wet season (generally beginning September). This information was utilized in developing a method for obtaining nymphs during August-October when no adults are present in pasture. During the latter part of April and May, spittlebug adults are caged on potted *B. decumbens* plants (usually one clump in the center of 2 kg capacity pot) for 2-3 days. Thereafter, the grass is clipped to about 10 cm height and the pots held in dishes to which water is added as needed, i.e., the soil in the pots is not allowed to be completely dry. Because of heavy damage suffered by the plants, very little new growth appears. In early August, about 150 *B. decumbens* seeds are scattered over the soil surface of the pot and are not covered with soil. Thus, the emerging humphs have young seedlings to feed on. The seedlings with nymphs are removed when needed. Nymphs were obtained in this manner during 1983/84; however, records of nymphal counts were kept only during 84. A total of 40 pots were used for a study on nymphal emergence. Adults were collected in the last week of April and the numbers caged per pot were estimated to be between 60-100. The soil and plants from six randomly chosen pots were washed and examined for eggs (NILAKHE *et alii*, 1984). The mean number of eggs per pot was $278.5 \pm \text{SE of } 148.5$. Observations on the remaining 34 pots showed that the nymphs began to appear from the first week of August with two major peaks, one during the third week of August and the other during the second week of September (Table 1). The egg hatch covered a period of almost four months; however, about half of all the nymphs that emerged had appeared during the first five weeks. Studies are needed to verify if the same pattern would occur under field conditions. After the 22nd of November, the observations were continued for another four months, however, no nymphs appeared. Assuming that all emerging nymphs survived, it can be noted that 43% of the eggs (120.2 of 278.5) survived through the dry season. The same method of obtaining nymphs could be used when the adults lay eggs that hatch in a normal hatching period (about 2 weeks). In such a situation the grass seeds could be mixed in the soil before the adults are caged for oviposition on the potted grass plants. The methods developed here were used for obtaining nymphs of *Z. entreriana*; however, the same methods probably could be used for spittlebugs of the genus *Deois*.

TABLE 1 - Hatch pattern of spittlebug eggs following diapause, Campo Grande, MS, 1984.¹

Observation date	\bar{x} no. of nymphs/pot \pm SE ²
05/08	2.35 \pm 0.41
08/08	3.41 \pm 0.62
17/08	26.94 \pm 2.31
11/09	27.59 \pm 3.26
13/09	2.94 \pm 0.66
15/09	6.91 \pm 1.08
17/09	5.20 \pm 0.96
19/09	3.65 \pm 0.43
22/09	4.88 \pm 0.67
25/09	2.62 \pm 0.27
28/09	2.59 \pm 0.42
01/10	2.88 \pm 0.54
03/10	2.62 \pm 0.41
05/10	3.26 \pm 0.52
08/10	3.65 \pm 0.43
10/10	3.76 \pm 0.59
15/10	4.00 \pm 0.64
17/10	1.88 \pm 0.35
19/10	2.02 \pm 0.29
22/10	1.52 \pm 0.28
25/10	1.70 \pm 0.29
29/10	1.71 \pm 0.35
01/11	0.29 \pm 0.15
07/11	0.76 \pm 0.22
09/11	0.26 \pm 0.10
17/11	0.47 \pm 0.12
22/11	0.38 \pm 0.13

¹ Adults were allowed to oviposit on potted grass plants in the last week of April. The mean number of eggs per pot were estimated to be 278.5. The pots were held in dishes to which water was added as needed. No nymphs were obtained between 3-17 August. Between August 17 and September 11, only 0.32 nymph/pot was obtained.

² Mean based on 34 pots.

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