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### PRELIMINARY NOTE ON THE STERILIZATION OF THE MALES OF *CULICOIDES NUBECULOSUS*

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In recent years, chemosterilization of insects has been investigated extensively as a new method of insect control. It appears that the use of chemosterilants, in contrast to gamma or X-ray irradiation, offers numerous advantages (Mulla 1964). Studies on the competitiveness of chemosterilized and gamma-ray sterilized males of *Aedes aegypti* showed the former to be more competitive with normal males than males sterilized by gamma radiations (Weidhaas and Schmidt, 1963).

Many studies on mosquito sterilization have been made (Patterson et al. 1971) (Grover et al. 1979) . . . , but *C. nubeculosus*, like most *Culicoides*, has not been very thoroughly studied. However, some irradiation studies

have been made for *C. varipennis* (Jones 1967). Three chemosterilants (tepa, metepa and thiotepa) have been used in the evaluations against mosquitoes. Several methods of sterilization have been tested: by exposing the pupae of *A. aegypti* (White 1966), or the third or early fourth instar larvae until pupation (Dame et al. 1964) in the chemosterilant solution. The present note reports that thiotepa is an effective sterilant of the pupae of *Culicoides nubeculosus*.

**METHOD.** Male pupae, 2-16 hours old, of *C. nubeculosus* were immersed in a solution of thiotepa (0,9 and 1%) for a period of 1 to 4 hours at a temperature of 26+2°C. The pupae were rinsed twice in water and transferred into vials (7x5m) for emergence.

Untreated adult females were put with the treated males and at the end of the mating period, the females were fed on mice; after 2 days, the eggs laid were deposited in the water. The number of eggs laid by each group of females was recorded (control and experimental), and after 6 days the number of eggs which had not hatched was counted and the percentage of sterile eggs determined.

Result: shown in accompanying Table.

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T ♂♂ × N ♀♀ N° exp	1				2
	0,9%				1%
Concentration of Thiotepa	1st		2nd		1st
Laying					
Exposure period (hr)	2	4	2	4	4
N° ♀ or ♂	35	35	32	31	65
Total N° of eggs laid	741	890	840	650	1900
N° of eggs hatched	34	54	33	60	19
% sterile	95,4	93,9	97	90,8	99
Control N ♂♂ × N ♀♀					
N° ♀		35		32	65
Total N° of eggs		619		500	2000
N° eggs hatch		491		394	1600
% sterile		20,7		21,2	20

T = Treated      Sterilizing effect of Thiotepa on males of *Culicoides nubeculosus*, after the exposure of 2-16 hours old pupae to a solution of Thiotepa for 2 to 4 hours.  
N = Normal

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U.S. ARMY, ENGINEER CORPS ISSUES A PERMIT FOR SALT MARSH MOSQUITO SOURCE REDUCTION IN GLYNN COUNTY, GEORGIA

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The most significant pest mosquitoes in Glynn County, GA are the salt marsh species *Aedes sollicitans* (Walker) and *Ae. taeniorhynchus* (Wiedemann). These mosquitoes commonly breed in hummock sloughs, sand dune swales, dredge spoil sites, high marsh meadows and barrens, and other areas above the mean water line in the salt marsh. In addition to the copious production of mosquitoes, these areas share the common feature of being extremely unsuitable for the efficient operation of standard earth moving equipment. Consequently salt marsh source reduction projects in many mosquito abatement districts along the east coast during the years before 1975 have been very expensive. Some observers concluded that source reduction could be 1.4 to 3.5 times as

expensive as temporary controls and therefore might not always be economically feasible (DeBord et al. 1975). New equipment innovations, especially mounting rotary ditchers on amphibious carriers, have drastically reduced the costs of excavation and construction in salt marsh habitats (Shisler et al. 1978). Furthermore, the rotary ditcher's ability to scatter the excavated material along the side of the ditch is even more important because it greatly reduces the spoil impact on the ecosystem. The reduction in cost and the minimal ecological impact combined to allow the staff of Glynn County Mosquito Control Department to begin the implementation of a safe and effective Salt Marsh Mosquito Source Reduction Program during January of 1980.

The initial permit application was submitted to the U.S. Army Engineer Corps' Environmental Assessment Division on April 18, 1979 and was finally granted on January 15, 1980. The major event which affected the outcome of the application was the public hearing of October 10, 1979. Many separate meetings and much work with local environmental groups, particularly the local chapter of the Audubon Society, preceded the official public meeting. The staff of the Mosquito Control Department determined that local environmentalists needed to be thoroughly and honestly familiarized with the nature, scope, and (most importantly) the objectives of the proposed source reduction program. Almost all of the various groups and individuals targeted by the Department for this awareness campaign were in complete agreement that any risks to the estuarine environment from this type of abatement program were by far outweighed by the potential benefits in the reduction of pesticide pressures on the ecosystem. The conserving of petroleum products in the form of fuels, lubricants, and pesticides that would result from the reduction of the mechanized application of chemical controls also appealed to many of the concerned citizens who were briefed by the Department's staff. Many of these individuals, including a delegation from the local Audubon Society, were in attendance during the public meeting and helped the Department personnel successfully argue the merits of this type of mosquito abatement with representatives of various federal agencies.

The Savannah District of the U.S. Army Corps of Engineers finally granted the permit on January 15, 1980. The permit specifically allows the Glynn County Mosquito Control Department to perform "general surface draining: routine construction, repair and