

tive in color. Thus, a large series of normal field-collected mosquitoes from any study area must be examined prior to selection of the dye, in order to rule out the possibility of a naturally occurring fluorescent material being mistaken for the dye used.

SUMMARY

The fluorescent dye rhodamine-B has been proven satisfactory for the marking of mosquitoes in flight range studies. Use of this dye and its recognition by ultra violet light after recapture leaves the specimens in suitable condition for other studies, including virus isolation or dissection for *Plasmodia*. Details are given of the methods of applying and recognizing the dye found most satisfactory for field studies.

In 1946 *Culex quinquefasciatus*, *Culex tarsalis* and *Culex stigmatosoma* were demonstrated to have a flight range of at least 2.5, 0.5 and 1.0 miles respectively.

In 1947 studies, observation of the flight range for *Culex tarsalis* was extended to 2.5 miles, and *Culiseta incidens* and *Anopheles pseudopunctipennis franciscanus* were found at distances of 0.6, and 0.9 mile respectively from the release point.

It is concluded that in Kern County, California, under the conditions of these experiments the effective flight range of *Culex tarsalis*, *Culex quinquefasciatus* and possibly *Culex stigmatosoma* is at least 1 mile. For protection against disease bearing or pest activities of these three species, mosquito control activities should be carried out for a radius of at least one and

a half miles from any population it is necessary to protect.

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References

1. EYLES, D. E., A critical review of the literature relating to the flight and dispersion habits of anopheline mosquitoes. U. S. Public Health Service, Public Health Bull. No. 287, 1944.
2. CLARKE, J. L., Flight range and longevity of mosquitoes dusted with aniline dye. Proc. 30th Ann. Meeting, New Jersey Mosq. Extern. Assn. pp. 227-235, 1943.
3. ZUKEL, J. W., Marking *Anopheles* mosquitoes with fluorescent compounds. Science, 102: 157, 1945.
4. CHANG, H. T., Studies on the use of fluorescent dyes for marking *Anopheles quadrimaculatus* Say. MOSQUITO NEWS, 6:122-125, 1946.
5. EYLES, D. E., AND COX, W. W., The measurement of a population of *Anopheles quadrimaculatus* Say. J. Natl. Mal. Soc., 2:71-83, 1943.
6. RUSSELL, P. F., KNIFE, F. W., RAO, T. R., AND PUTNAM, P., Some experiments on flight range of *Anopheles culicifacies*. J. Exp. Zoo., 97:135-163, 1944.
7. GILMOUR, D., WATERHOUSE, D. F., AND McINTYRE, G. A., An account of experiments undertaken to determine the natural population density of the sheep blowfly. Council Sci. and Ind. Res., Commonwealth Australia, Bull. No. 195, 1-39, 1946.
8. JACKSON, C. H. N., On the true density of tsetse flies. J. Anim. Ecol., 2:204-209, 1933.

KING HONORS DR. BISHOPP

Dr. F. C. Bishopp of our Bureau of Entomology and Plant Quarantine was recently awarded His British Majesty's Medal for Service in the Cause of Freedom, in recognition of his valuable services to the Allied war effort in various fields of scientific research and development. Lord Inverchapel, the British Ambassador, conveyed his personal congratulations as well. The decoration will be tendered the Chief of Protocol, Department of State,

who will hold it until Dr. Bishopp can legally receive it. Because of material shortage in the United Kingdom, it will be some months before the insignia becomes available, but the ribbon will be sent the Department of State in the near future. This is a signal honor for a USDA worker.—(From Vol. 8, No. 6. of USDA, a government publication for Agriculture employees.)