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A TABULATION OF INSECTS RECOVERED FROM AIRCRAFT ENTERING THE UNITED STATES AT MIAMI, FLORIDA, DURING THE PERIOD JULY 1943 THROUGH DECEMBER 1944

Attached is a paper, prepared by Messrs. Donald G. Denning, John J. Fratt, Jr., Arthur E. Staebler, and Willis W. Wirth, concerning stowaway insects taken from airplanes arriving at Miami from points outside the continental United States during the period July 1943 through December 1944.

In order that the paper may be of maximum usefulness to plant quarantine inspectors the list of insects recovered from planes has been reviewed by Dr. M. D. Leonard and an asterisk has been placed in front of the name of each genus and species which is known to be of any importance as a plant pest. Genera and species known to occur in the continental United States have been designated by "US" and the general distribution of some of those not known to be in the continental United States has been indicated in parentheses following the name of the insect. Dr. Leonard has also prepared, as a supplement to the list, brief statements on the distribution and economic importance of the insects listed which appear to be of most significance from a plant quarantine standpoint.

In view of the length of this Memorandum it should be filed only in Code I3 and this title sheet only should be placed in the numerical file.

P. P. Lauck

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The United States Public Health Service is legally responsible for the enforcement of foreign quarantine measures on all aircraft entering the United States, its territories and possessions from abroad. In order to prevent the importation of exotic insects of medical importance, regulations have been put in force requiring the disinsectization of all planes from certain specified areas. Since there has been wide variation in the quarantine inspection and disinsectization procedures used at various airports throughout the world, it seems appropriate to describe at this time the procedures which have proved to be the most satisfactory at the Miami, Florida, Quarantine Station in securing what is believed to be a high degree of protection against the importation of exotic insect disease-vectors.

Upon the arrival at a Miami airport of each plane from a quarantinable area, crew members and passengers may disembark at once provided that the aircraft was subjected to a disinsectization spraying during the flight. The plane is then boarded immediately by a Public Health Service inspector, all openings are tightly closed, and the plane undergoes a terminal spraying with a pyrethrum aerosol spray. If the aircraft has not been sprayed before entering quarantine, it is boarded immediately upon its arrival, closed, and sprayed before passengers and crew disembark. In either case the aircraft is sprayed with a dosage of 100 milligrams of pyrethrins per 1,000 cubic feet of space and closed for a minimum time of three minutes. This relatively high dosage is used in order to insure a high degree of killing efficiency. During the terminal spraying procedure special attention is given to the outside baggage compartments and other places not likely to be sprayed when the plane is in flight. No one may enter or leave the plane until it has been given pratique by the Public Health Service representative. Immediate inspection of the aircraft, prior to the Public Health Service spraying, is made to recover any living or knocked-down[1/] insects as a check of the efficacy of the disinsectization measures employed enroute. During the three minute spray exposure time, and as long thereafter as is practicable, a thorough search is made for all insects--living, knocked-down, or dead.[2/] Many of the insects listed in this paper as living or knocked-down were brought into this country in a viable condition and might have remained living and able to leave the aircraft had not the plane undergone a terminal spraying.

All specimens recovered are identified as completely as possible by the entomologists at the Public Health Service Quarantine Station. If a species is not represented in the station reference collection by authentically determined specimens, it is sent to the Division of Insect Identification, U. S. Bureau of Entomology and Plant Quarantine for determination. All identifications are tabulated monthly, and routine reports are furnished airline and public health officials for use in evaluating the effectiveness of the disinsectization as performed by the airline and quarantine personnel.

1/ The term "knocked-down" is used to denote those insects paralyzed by the pyrethrum spray, some of which may eventually recover.

2/ It must be assumed that some insects tabulated as "Recovered Dead" may have been alive or knocked-down when the plane landed but were killed as a result of the terminal spraying.

The data contained in this paper were obtained from inspections of 10,757 aircraft arriving at airports of entry in the Miami, Florida, area during the period July 1, 1943, through December 31, 1944. Nearly all types of larger passenger and cargo land and sea planes, as well as the larger military transport and tactical land and sea planes, were represented. From these planes a total of 36,234 insects was recovered; of these 4,670 were alive and/or knocked-down, and 31,564 were dead. Slightly over 5% (117) of the mosquitoes recovered were living or knocked-down; the remainder (1,867) were dead.

Insects were recovered on 6,742 of the aircraft inspected. However, failure to find insects on planes does not necessarily indicate that none are present because there are numerous inaccessible places where living insects may hide and where dead insects may fall or be blown. Probably only a small percentage of the insects on each plane was recovered; this recovery is considered significant as representing a random sample of the insect fauna that may be carried on aircraft.

It will be noted that a number of the species listed in the table are native to the United States, particularly southern Florida. From the writers' experience it is believed that the number of insects boarding aircraft at any airport is proportional to the period of time the aircraft remains open while on the ground at the airport; but, of course, is influenced by the abundance of actively flying insects on the airport environs. The operation of bright lights at night in and around planes which are being serviced also attracts many insects, especially mosquitoes, to the planes. Since the Miami airports serve as the home terminus and maintenance point for the majority of the planes inspected, the native insects found can thus be readily explained.

The following table is offered as a summarization of the various orders of insects recovered.

Order	Number of Insects Recovered Alive and/or Knocked-down.	Number of Insects Recovered Dead.
THYSANURA	5	12
ORTHOPTERA	390	390
DERMAPTERA	3	14
EPHEMERIDA	1	146
ODONATA	0	16
ISOPTERA	0	27
CORRODENTIA	7	41
THYSANOPTERA	7	6
HOMOPTERA	16	710
HEMIPTERA	15	444
COLEOPTERA	92	1458
NEUROPTERA	0	60
TRICHOPTERA	0	74
LEPIDOPTERA	56	1491
HYMENOPTERA	206	1582
DIPTERA	3872	25093
Totals	4670	31564

The authors believe that this report will further demonstrate the role of aircraft in transporting insect stowaways. The transplantation of living insects from one region to another is a potential threat that must be recognized.

ACKNOWLEDGMENT

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Insects	Alive or knocked-down	Dead	Planes
Vespidae spp.		31	18
Chartergus sp.	1		1
Eumenes maxillosus conicus (F.)		1	1
Gymnopolybia pallipes (Oliv.)		3	1
Mischocytterus phthisicus (F.)		1	1
Nectarina augusti Sauss.		2	2
Odynerus spp.		164	33
" sichelii Sc.		26	3
Polistes spp.		31	30
" canadensis (L.)		1	1
" crinitus (Felt)	1	5	6
" major Pal.		4	2
" olivaceus (Deg.)		65	23
" versicolor vulgaris Beq.		4	4
Polybia spp.		8	4
" dimidiata (Oliv.)		2	2
" ignobilis (Hal.)		1	1
" occidentalis (Oliv.)	1	16	16
" rejecta (F.)	1	26	27
" sericea (Oliv.)		2	2
Ropalidia sp.		1	1
" marginata (Lep.)		8	4
Rygchium spp.		4	3
" brunneum (F.)		2	3
" haemorrhadalis var. quinquecinctus (F.)		4	3
Vespa spp.		2	2
" affinis (L.)		31	12
" orientalis L.		5	4
" tropica L.		14	7
DIPTERA spp.	2	253	131
Agromyzidae spp.	16	126	77
US *Agromyza spp.		2	2
US * " virens Loew		5	5
US Chyromyia spp.	1	1	2
near Chryomyia spp.		2	2
US Desmometopa M-nigrum (Zett.)	18	256	216
US Leucopis sp.		1	1
US Neoleucopis spp.		2	2
US near Madiza sp.		1	1
US Milichia sp.	1	1	2
US Milichiella sp.	32	92	85
US " sp. near lacteipennis (Loew)	2		2
Pelomyia spp.	2	1	3
US Tethina (?) spp.		3	3
Anthomyiidae spp.	1	45	30
US Athergonia orientalis (Schin.)	6	124	77
Coenosia spp.	3	14	14
US " calopyga Loew		2	2
US " ovata Stein		3	2