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by
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THE GENUS *DROSOPHILA* IN NEW GUINEA AND SABAH

Introduction

Since 1959 evolution in the genus *Drosophila* has been studied in the Territory of Papua and New Guinea by the Genetics Laboratory, Department of Zoology, University of Queensland (Angus, 1961, 1964, 1967 *a* and *b*; Bock, 1966; Bock & Baimai, 1967; Dobzhansky & Mather, 1961; Khan, 1966; Mather, 1959, 1961 *a* and *b*, 1962 *a* and *b*, 1963 *a*, *b*, *c*, *d*, and *e*, 1964 *a* and *b*, 1965, 1966 *a* and *b*, 1967; Mather & Dobzhansky, 1961).

In 1966 it was decided to extend the Laboratory's sphere of interest to Sabah which is part of a land mass comparable in size to New Guinea and at a similar latitude. It has a similar climate but is over 2,000 miles to the west. The purpose of this paper is to set out the results of collecting in Sabah and to compare them with the results of a collection made under similar conditions at Madang, New Guinea.

Materials and methods

In July 1966 samples were taken from Madang in New Guinea (Fig. 1) by exposing fermenting banana baits in secondary jungle about 4 miles from the town.

In August 1966 the genus was sampled from fermenting banana baits at Jesselton, Sandakan, and two stations at Tawau (Fig. 1). At Jesselton the baits were placed in patches of lush vegetation near the town, at Sandakan in a rubber plantation 5 miles from the town, and at Tawau in a rubber plantation 10 miles from town (Tawau I) and in a cocoa plantation at the Agricultural Station 2 miles from town (Tawau II).

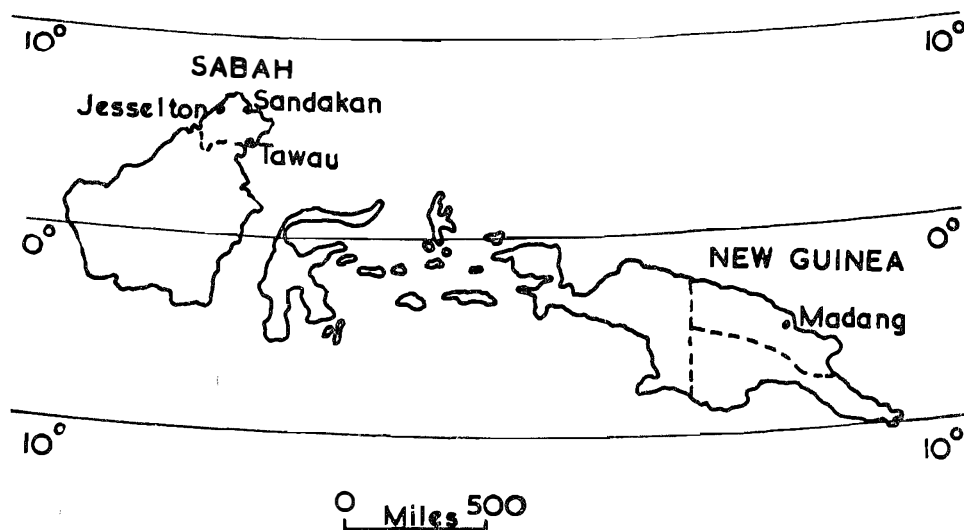


FIG. 1.—Sampling stations in New Guinea and Sabah

Results

The primary sorting of the flies yielded the results shown in Table 1. The results in Table 2 were obtained from samples of *melanogaster* group females individually bred out and identified by their male progeny.

It will be noted that at all stations the *melanogaster* group is dominant. The *immigrans* group is represented in Sabah by *D. pararubida* and *D. setifemur*. The ubiquitous *D. rubida* of northern Queensland and Papua-New Guinea appears to be absent from Sabah.

Discussion

It will be noted (Table 3) that Madang in New Guinea and Jesselton, Sandakan, and Tawau in Sabah have similar climates. Although there are considerable differences in total annual rainfalls, in the two months immediately preceding collection the rainfalls are similar. Thus in all areas there is a luxuriant vegetation able to support a substantial *Drosophila* fauna. Maximum and minimum temperatures and latitudes of all stations are very similar. Madang in New Guinea is over 2,000 miles from Sabah, but in spite of this geographical isolation superficially the *Drosophila* fauna is very similar (Tables 1 and 2).

Cultures of the species from Sabah are being studied in relation to cultures of the species from Madang as regards chromosomal differences and sexual isolation.

Acknowledgments

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TABLE 1
Primary sorting

	JESSELTON		SANDAKAN		TAWAU I		TAWAU II		MADANG	
<i>D. setifemur</i>	147	12%	346	26%	16	4%	37	2%	205	3%
<i>D. pararubida</i>	10	1%	10	1%	15	3%	129	6%	545	8%
<i>D. tetrachaeta</i>	—	—	—	—	2	—	—	—	24	—
<i>D. argentostrata</i>	2	—	—	—	—	—	—	—	7	—
<i>D. silvistriata</i>	—	—	—	—	—	—	—	—	2	—
<i>melanogaster</i> group	1087	87%	966	73%	427	93%	1965	92%	5848	88%
Total	1246		1322		460		2131		6631	

TABLE 2
melanogaster group sample

	JESSELTON		SANDAKAN		TAWAU I		TAWAU II		MADANG	
<i>D. ananassae</i>	27	61%	24	43%	41	68%	5	12%	69	28%
<i>ananassae</i> -like	—	—	—	—	—	—	2	5%	108	43%
<i>D. szentivani</i>	6	14%	12	21%	8	13%	34	81%	35	14%
<i>D. mayri</i>	—	—	—	—	—	—	—	—	6	2%
<i>pseudotakahashii</i> -like	4	9%	4	7%	2	3%	—	—	28	11%
<i>D. serrata</i>	—	—	—	—	—	—	—	—	2	1%
<i>D. dominicana</i>	4	9%	15	27%	5	8%	—	—	—	—
<i>serrata</i> -like I	1	2%	—	—	4	7%	1	2%	1	—
<i>serrata</i> -like II	2	4%	—	—	—	—	—	—	—	—
<i>serrata</i> -like III	—	—	1	—	—	—	—	—	1	—
Total	49		56		60		42		250	

TABLE 3
Climatic averages

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	YEAR
Madang 5°S													
1.	87	86	87	88	88	88	88	88	88	89	88	88	
2.	75	75	75	75	75	74	74	74	75	75	75	75	
3.	12	12	15	17	15	11	8	5	6	10	13	14	138
Jesselton 6°N													
1.	84	85	86	87	88	87	87	86	87	86	86	85	
2.	73	73	74	75	75	75	74	74	74	74	74	73	
3.	4	2	3	5	9	11	10	9	12	13	12	9	99
Sandakan 6°N													
1.	84	84	85	88	89	89	89	89	89	88	87	85	
2.	73	74	74	74	74	73	72	72	72	73	73	73	
3.	16	8	6	4	5	7	6	8	9	10	13	17	109
Tawau 4°N													
1.						Not available							
2.						Not available							
3.	5	3	3	4	7	7	7	8	5	5	6	5	65

1. Average daily maximum temperature (°F).
2. Average daily minimum temperature (°F).
3. Average monthly and yearly rainfall (in.).

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