

A MASSED NUPTIAL FLIGHT OF *PONERA EDUARDI* Forel.

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The available information on the time of nuptial flights of *Ponera eduardi* in New Zealand, is that males have been taken away from the nest at Auckland at the end of January (Brown 1958); and that flights are common in North Auckland areas in late February and March (Cumber 1959).

It therefore seems worth recording a spectacular massed nuptial flight which occurred in the Auckland area on Sunday, April 7, 1963, and received a front page report in The New Zealand Herald of April 8, under the headlines "Flying Ants by the Million Invade Harbour : Spread for Miles : Swarms Infest Boats, Sea and Beaches." The published report indicates ants spread over an area from the Thames estuary to Rakino and Tiritiri Island in sufficient numbers to form an intermittent black scum over several miles of water. These reports were fully confirmed and extended by D.S.I.R. yachties in the area at that time. They state that at the worst the annoyance and irritation was so intolerable that it was seriously considered going overboard to obtain relief.

On the day of this massed flight there was brilliant sunshine and calm with the lightest of offshore breeze. The two previous days had been wet and cold but the Thursday had been brilliant sun and calm. Before that the weather had been cold, wet and gusty for a considerable period.

Obviously the massed flight was the result of a synchronised emergence from a large number of nests over a wide area. The most likely hypothesis as to why the nuptial flights should be synchronised is that the alates had been confined to their nests by the inclement weather over the period when nuptial flights normally occur. The only calm and fine day for a considerable period prior to the actual flight was Thursday, April 4, but this was both colder and drier than the day on which the flights occurred. The averaged hourly readings from the Albert Park meteorological station during the period 9 a.m. to 1 p.m. are:—

	Temp. F°	R.H. %
Thursday, 4 April	59.1	51
Sunday, 7 April	64.2	69

The 9 a.m. differences being 6.7°F and 23% R.H. These differences are sufficient to suggest that either temperature or humidity or a combination of both act as the final trigger for the nuptial flight and that the required thresholds were not reached on April 4 but were adequate on April 8.

Such thresholds must be genetically determined and would not have evolved unless advantageous to the species; and there is obvious survival advantage in restricting flights to periods that are warm and fine and excluding the inclement. But there is also an interesting evolutionary significance in occasional synchronised flights of alates from many nests over a wide area. The genetic basis of the complex social organisations and behavioral patterns of social hymenoptera and termites may be best conserved by a restricted gene flow within the whole population. This is certainly achieved by unsynchronus nuptial flights which involve an almost exclusive brother sister mating. However, sib mating continued for long periods would fragment the species into fixed genetic isolates and would lose the species the advantages of genic diversity. If adverse conditions occasionally result in synchronised nuptial flights there is greatly increased probability that a female would be fertilised by a male from another nest and thus maintain both evolutionary uniformity and genic diversity for survival of the species.

REFERENCES

- BROWN, W. L., 1958: A review of the ants of New Zealand (Hymenoptera). *Acta Hymenopterologica* 1: 1-150.
- CUMBER, R. A., 1959: Distributional and biological notes on sixteen North Island species of Formicidae (Hymenoptera). *N.Z. Entomologist* 2(4): 11-14.