ON THE NESTS AND POPULATIONS OF SOME VESPID WASPS

G. J. SPENCER[1]

The year 1957 was a year of wasp abundance in the lower Fraser Valley as was 1943 in the interior of the Province.

I had occasion to remove a number of nests of *Vespula (Dolichovespula) arenaria* (Fabricius) and one each of *V. vulgaris* (L) and *V. pensylvanica* (Saus.) in West Point Grey district of Vancouver and kept counts of the populations in each nest. The procedure in taking the nests was to wait until at least 10:30 at night when all activity had ceased around the nests and to set up a powerful spotlight at a distance on a stand so as to illuminate the area, then to squirt the jet of a 5% D.D.T. aerosol bomb into the entrance of the nest while holding underneath a sack stretched open on a round frame of heavy wire. The wasps poured out into the sack; when no more came out the nest was cut from its supports, dropped into the sack and examined next morning when practically all wasps were dead. Later, I used a small compression sprayer filled, at the suggestion of Professor K. Graham, with carbon tetrachloride which was much faster than the D.D.T. aerosol bomb since it immobilized the wasps instantly; however those that had not received a good shot of it tended to recover and had to be re-treated. Since all the nests contained combs with capped pupal cells, they were caged until emergence had ceased, then counts were made of each caste and the nests were set aside for the emergence of parasites and scavenger moths, which may occur as much as 10 months later.

TABLE of Populations of Wasps Nests

Nest No.	Drones	Queens	Workers	Total	Parasites	Caterpillars
D. arenaria						
1	470	77	695	1242	150	1
2	132	160	612	904	0	2
3	1	42	241	284	3	0
4	159	6	146	311	12	0
5	0	1	53	54	3	0
V. vulgaris						
6	32	43	2230	2305	0	0
V. pensylvanica						
7	126	33	224	383	0	0

Notes on These Nests

The parasites mentioned in the table are *Sphecophaga burra* (Cresson), Ichneumonidae (3) and the caterpillars are those of the moth *Vitula serratilineela* Ragenot, Pyralidae, as determined by comparing their adults with those in the Blackmore-Wynne collection at the University; this identity has not been checked by an authority.

Nest 1 taken 28 June 1957 from under the eaves on the south east corner of a garage, consisted of 6 combs inside 4 outer paper walls. The number of drones in this nest is surprising, being nearly 38% of the total population and 6 times the number of queens.

[1] University of British Columbia, Vancouver, B.C.

Nest 2 taken 5 July from under the steps on the south east corner of a back verandah, consisted of 7 combs and 4 outer paper walls. Samples of these wasps were weighed directly after being killed to give the relative weights of each caste; 99 drones weighed 17 grams = 0.1717 grams each; 135 queens weighed 40.4 grams = 0.2886 grams each and 612 workers weighed 70.8 grams = 0.1157 grams each.

Nest 3 taken 24 July was scraped off a window pane facing south in a cottage on the first slope of Mount Seymour; it consisted of 4 combs and a new and completely empty one the size of a silver dollar, under no fewer than 11 outer walls reducing to 6 at the entrance and was obviously a new nest. Of the 42 queens, 13 were race *fernaldi* and of the 241 workers, 3 were *fernaldi.* The race *fernaldi* (Lewis) according to Bequaert (1), is only a xanthic form of *arenaria* characterized by 2 large round yellow spots on the propodeum which are not found in normal *arenaria.*

Nest 4 was brought in by a sanitary inspector on July 29 and consisted of 7 large combs; he had removed it from a laurel hedge after drenching it with gallons of insecticide, thus reducing it to a soggy mess. From the size of the combs, this must have been a very large nest with a large population of wasps of which only a few (311) reached me. Since drones usually hang around a nest, their number, 159, was probably normal but most of the workers were missing. Of the drones, 42 were race *fernaldi;* of the 6 queens, 4 were *fernaldi* and of the 146 workers, 46 were *fernaldi.* According to Buckell and Spencer (3) drones are not usually of the race *fernaldi* so this number 42, is of note. No nests have yet been taken where all wasps were of race *fernaldi.*

Nest 5, given me by Dr. K. Graham, was taken by him on 6 August at Langley Prairie and consisted of only 2 combs of which the larger was 2¾ x 2½ ins. across. The nest had obviously been recently started because the queen only was of normal size, the 53 workers were very small.

Nest 6, Vespula vulgaris (Linn.) was taken 23 August from under the roots of a clump of iris in a rock garden facing north. The entrance was about one inch across and the combs when excavated from between the plant roots and stones were found to be of very irregular shapes and sizes and to occupy a hole roughly 12 ins. x 10 ins. There were no outer walls. The labour involved in excavating such a large hole must have been colossal. One queen out of the 43 taken was immense and was probably the founder of the nest; the others were apparently the season's brood. Amongst the normal - sized workers, were over 80 only one third the size of the others, being about 1 centimetre long; Mr. C. D. F. Miller, hymenopterist of the Research Branch, Ottawa, informs me that such dwarfs sometimes occur in wasps' nests and are apparently only xanthic forms of normal specimens; the reason for their occurrence is unknown.

Nest 7. On 19 October 1958 I was asked to remove a wasps nest from a compost heap in a friend's garden. The heap consisted of regularly-cut slabs of turf built up like bricks in a wall with spaces between the sods. Taking this apart sod by sod, I found a number of little combs lying between the slabs with a dozen or so wasps around each comb, none of which contained brood or even eggs: each group had to be poisoned separately and the wasps collected. Well down inside the pile was the main comb with a large number of *Vespula*

pensylvanica (H. de Saussure) wasps around it. As with Nest 6 of *V. vulgaris* in the ground, there were no parasitized cells or scavenger caterpillars in the combs: apparently subterranean nests escape these intruders. It seems strange that workers should make isolated groups of cells away from the main colony; apparently the urge of the workers to build cells was stronger than that of the queens to lay eggs in them.

On 17 January 1958 a citizen in the Dunbar district of Vancouver telephoned to say that he had a wasp's nest in the corner of a back verandah roof, that measured 3 feet across: in spite of my doubting it, he stuck to his story. So I went over and after an arduous journey through my lady's dresses in a clothes closet, up a ladder and through a small trap-door in the roof, across the whole house length of rafters travelled the last part of the way on my stomach, I reached the corner where the sloping roof of the house met that of the verandah. Across the right angle of the corner was a nest 3 feet across and 18 ins. high, even as the owner had stated. From what I could reach of the nest I scooped out a few handsful of comb and later recovered from it 2 dead workers and one male of *Vespula pensylvanica* (H. de Saussure), one *Ptinus fur* Linn. the white-marked spider beetle, one *Ptinus ocellus* Brown (*tectus* Boield) the Australian spider beetle, several exuviae of *Anthrenus verbasci* (Linn.) the varied carpet beetle and one scavenger moth caterpillar. The owner said that the nest had been inhabited for 2 years in succession and feared that it would be re-occupied the coming season. I urged its total removal and the blocking-up of the entrance holes since the dermestid beetles that it haboured could very well invade the house.

Further note on the scavenger moth Vitula serratilineela Rag.

In August, 1959, I was given two nests of *D. arenaria* and one of the white faced hornet *Vespula maculata* (Linn.) with a few dead wasps in each and evidences of caterpillar silk between the tiers of comb of *arenaria* but not of *maculata*. They were maintained in a carton with a loose cover and from the end of February, 1960, to the end of June, moths flew out of the carton and around the room where the better specimens were collected and pinned. By August every comb was plastered with silk webbing and the frass of caterpillars, and the frass of wasp larvae which is compacted at the base of every cell, was completely consumed; dried bodies of wasp larvae and pupae, were not eaten. This would indicate that the larvae of this moth are true scavengers and not predators of early stages of wasps. Further proof of the scavenging behaviour of these larvae was obtained when fifteen moths picked up dead from the window sill were placed in a covered Syracuse watch glass for relaxing later on. Some weeks afterwards when I examined the dish, I found that the bodies of all the moths had been eaten and a full-grown caterpillar was moving amongst the loose wings; this pupated and a moth eventually emerged. Apparently a moth had laid an egg on the body of one of those lying dead on the window sill and the resulting caterpillar found enough food in 15 moth bodies, to complete its development.

References

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