MATERIALS AND METHODS

The ants used in this work were collected mainly from the campus of Shizuoka University during 1978-1982, but some colonies collected from Odawara (Kanagawa-ken), Nagashima (Mie-ken), Yamaguchi (Yamaguchi-ken) and Amami Oshima (Kagoshima-ken) were also used for examining colony composition and chromosome observations. Because *P. pungens* does not have a fixed nest, we could only use bivouac colonies, which were located under fallen leaves or in rotten wood. For this reason, the estimate of colony composition, especially the number of workers, is probably biased (underestimated). We consider, however, that any such bias is negligible for the purposes of this study.

To examine worker oviposition, we took 100 workers from each colony and bred them for several months in plastic cages containing sterilized soil and fallen leaves, in an incubator at 27°C. *Tubifex* sp., *Chironomus* larvae, and honey diluted with water were supplied as food every week. When the first batch of larvae turned to young adults (callows), they (i.e., workers of the 2nd generation) were isolated from the starting colony. Old workers were discriminated from young ones by being marked with white enamel paint on their abdomens. The workers of the 2nd generation bred again without males. We continued the breeding experiments for up to three generations in the same manner. The number of progeny decreased gradually in each successive generation. We stress, however, that this decline in progeny did not result from unfavourable culture conditions, but rather from the breeding system we employed, i.e., only the first batch of offspring was used.

To determine the condition of worker ovaries, we dissected them out in insect Ringer's solution and counted the number of mature eggs, which were identified by their size and the amount of yolk. Ovaries of some workers were fixed in Carnoy's solution or FAA (formalin, 70 % ethanol, absolute acetic acid ; 5: 15: 1), embedded in celloidin and paraffin, and then sectioned (10-20 μm) for histological analysis.

Chromosome observations were made using cerebral ganglia of worker prepupa, ovaries of worker pupae, and testes of male pupae, using an air-drying technique (IMAI *et al.*, 1977).

RESULTS

Colony composition of *Pristomyrmex pungens*

To investigate the occurrence of ergatoid queens (ergatogynes) as reported by TERANISHI (1923), we examined the seasonal change of colony composition in 9 mature colonies collected on the campus of Shizuoka University. As summarized in *table I*, all colonies except one were composed only of small workers. The size of workers was quite uniform (head width taken across the compound eyes = 0.72 ± 0.02 mm S.D.). No morphological polymorphism involving so-called large workers, soldiers or queens was observed. The same result was obtained also for pupæ. *Table I* suggests that the breeding season of this species begins in April and continues until the end of September. The majority of pupae reared during the breeding season were small workers.

With respect to males, we found two colonies containing a few adult males (July 2, 1982) or pupae (2.5 % ; July 1, 1980). One of us (IMAI) collected (June 2, 1972) a colony with males from Amami Oshima, in which the frequency of male pupae against worker pupae was 3.3 %. These data suggest