

### The Chromosome Numbers of Six Species of Formicine Ants<sup>1,2</sup>

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Little work has been done on the chromosomes of ants. The 1st paper dealing specifically with ant chromosomes is that of Whelden and Haskins (1953). After 10 years of extensive cytological studies on various developmental stages in Formicidae, including 19 species representing 6 subfamilies, they concluded that the haploid chromosome number throughout the family is constant and is 5. Later studies by Hauschteck (1961, 1962), Imai (1966), Imai and Yosida (1965), Kumbkarni (1965), and Peacock et al. (1954) showed that the haploid chromosome numbers in ants range from 4 to 27. However, none of the authors reported a haploid number of 5.

During the summers of 1967 and 1968, I carried out a study of the chromosomes of ants at the University of North Dakota's Oakville Prairie Biological Field Station situated about 12 miles west of Grand Forks, N. Dak. Additional specimens from nests from other localities in this general vicinity also were used. The results are reported here.

Testes and ovaries from prepupae or pupae of sexual castes were used. In addition, the cerebral ganglia of workers at the prepupal stage also gave excellent results. A modification of the staining technique of Carr and

Walker (1961) was used. The material was dissected in normal saline. Removed organs were treated in 0.5% colchicine with a small amount of TC-chromosome medium for 1-2 hr at 37°C, and then transferred to a hypotonic solution (0.5% sodium citrate) for 10 min at the same temperature. The organs were then fixed in acetic-methanol, 1:3, for 40 min with 2 changes of fresh fixative. After this treatment, the organs were macerated and the preparation was centrifuged at 1000 rpm for 3 min. The supernatant was discarded and 4 ml of freshly mixed fixative were added to the isolated cells. The suspension was then dropped by a pipette on a precleaned micro slide which was air dried and passed through the following reagents: a, absolute ethyl alcohol, 10 min; b, 80% ethyl alcohol, 10 min; c, 50% ethyl alcohol, 10 min; d, distilled water, 15 min; e, carbol fuchsin solution, 1-12 hr; f, absolute ethyl alcohol, 2 changes with checking of preparation; and g, xylene, 2 changes, followed by mounting in balsam.

Chromosomes of the following 6 species of ants were observed:

1. *Formica montana* Emery (Fig. 1, 2).  $n = 27$ , from testes of male pupae collected from colonies nesting on the station grounds July 10, 1967.  $2n = 54$ , from brain of worker prepupae collected at the University of North Dakota's Forest River Biology Area near Inkster, N. Dak., Aug. 13, 1967.

2. *F. subintegra* Emery (Fig. 3).  $n = 26$ , from testes of male pupae collected at the station grounds July 26, 1967.

3. *F. obscuripes* Forel (Fig. 4).  $n = 26$ , from testes of male pupae collected near Mentor, Minn., May 19, 1968.

4. *F. ulkei* Emery (Fig. 5).  $n = 26$ , from testes of male prepupae collected at the station grounds June 12, 1968.

<sup>1</sup> Hymenoptera: Formicidae.

<sup>2</sup> Accepted for publication October 16, 1968.

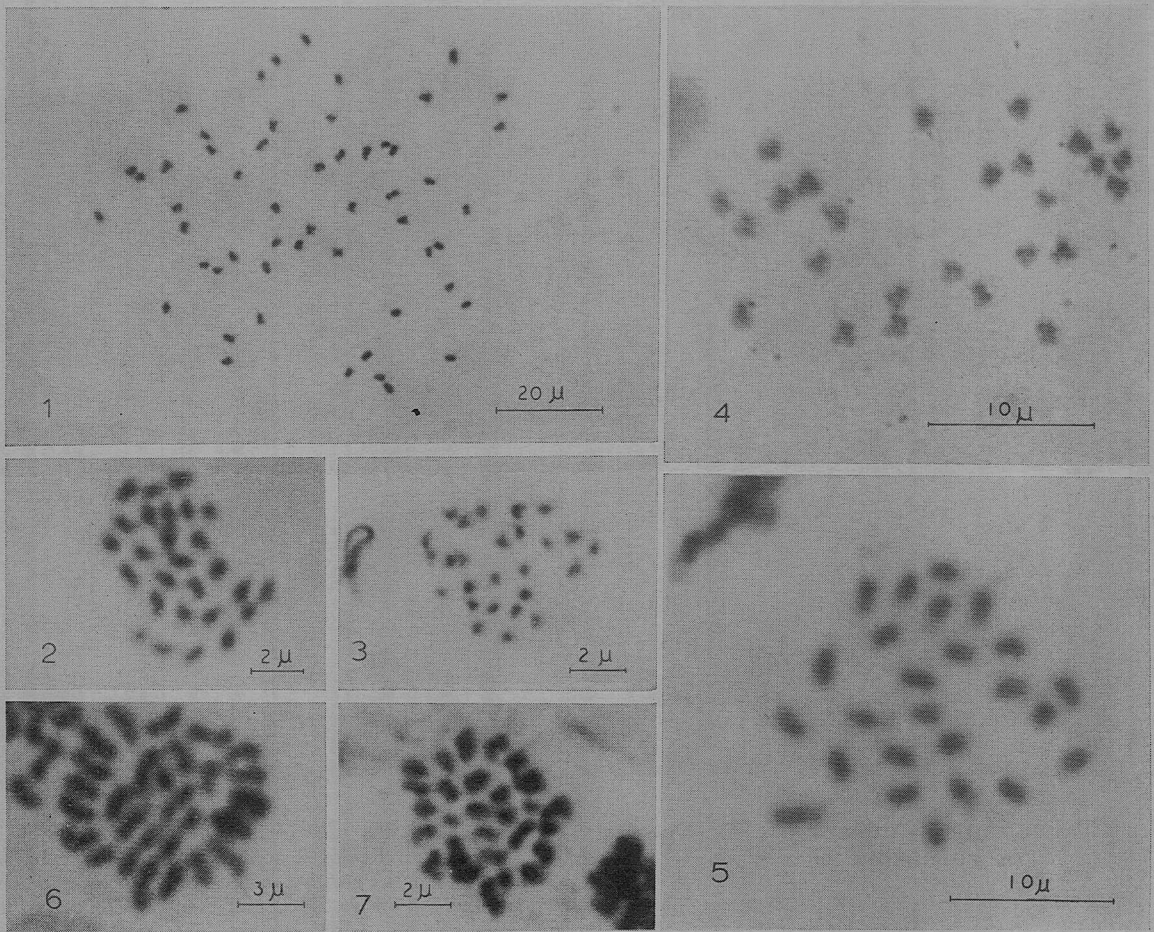


FIG. 1-7.—Chromosomes of ants. 1, *Formica montana*,  $2n = 54$ ; 2, *F. montana*,  $n = 27$ ; 3, *F. subintegra*,  $n = 26$ ; 4, *F. obscuripes*,  $n = 26$ ; 5, *F. ulkei*,  $n = 26$ ; 6, *Lasius pallitarsis*,  $2n = 28$ ; 7, *L. umbratus*,  $2n = 30$ .

5. *Lasius pallitarsis* Provancher (= *sitkaënsis* Pergande) (Fig. 6).  $2n = 28$ , from ovaries of female pupae collected at the station grounds July 10, 1967.

6. *L. umbratus* (Nylander) (Fig. 7).  $2n = 30$ , from ovaries of female pupae collected at the station grounds July 27, 1967. The same chromosome number was reported by Hauschteck (1962) for the European population of this species.

#### ACKNOWLEDGMENT

This study was supported by National Science Foundation Grant GB 6514, Paul B. Kanno, principal investigator. I am indebted to Dr. Syed M. Jalal, and Dr. Kanno for their guidance and suggestions, and to Dr. W. F. Buren for confirming the identification of *F. subintegra*.

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Reprinted from the

ANNALS OF THE ENTOMOLOGICAL SOCIETY OF AMERICA

Volume 62, Number 2, pp. 455-456, March 1969