

morphological sense, and individuals between these ("intercasts") are indicated by the terms "gynomorph", "ergatomorph" and "intermorph" (Buschinger and Winter, 1976, Buschinger 1978). The remaining colonies were kept and observed in the laboratory. From October 1979 to February 1980 they hibernated under natural temperature conditions at Darmstadt/FRG. After a severe frost period with temperatures reaching -12°C many adults were dead, but could still be dissected. The larvae survived, and a small number of sexuals and workers hatched until the end of March.

Sexual behavior was observed immediately after collecting the ants in the field, and during the first half of September, in the laboratory.

Karyotype studies were made following the method of Imai, Crozier and Taylor (1977), with male pupae collected in the field.

3) FEMALE POLYMORPHISM AND FUNCTIONAL MONOGYNY

The ant material was collected when sexual pupae and some newly eclosed sexuals were present in the nests. In Table I we did not distinguish between ergatogynes, uni-, bi- and triocellate workers, as was done by Holliday (1903); however, all these different forms did occur, alongside with alate or deälate gynomorphs and ergatomorphs without ocelli, like in the population studied by Holliday. We comprised all intermediate forms between alate/deälate females and apparently normal workers without ocelli as "intermorphs".

Table I reveals, at the first glance, that alate and deälate gynomorphs, and their pupae, are extraordinarily rare among the collected ants. Altogether we found 5 such specimens in 15 colony units, as compared to 240 intermorphs and 541 ergatomorphs. The respective numbers from Holliday (1903) are the following: queens (including microgynes): 36, intermorphs: 411, workers (including macroergates): 624 (These numbers, however, refer only to adults). The different numerical relations between adult intermorphs and ergatomorphs (109:375) and the immatures (131:166) in our material could indicate that workers preferably remain with their colony unit, whereas a considerable part of the intermorphs might leave the nest, mate and start new colonies. Further evidence for this interpretation is strongly provided by the dissections. Since it is difficult to include all the various combinations of different female forms and their reproductive function in a table, we will give the results of our dissections hereafter for each colony unit separately. Numbers correspond to those in table I.