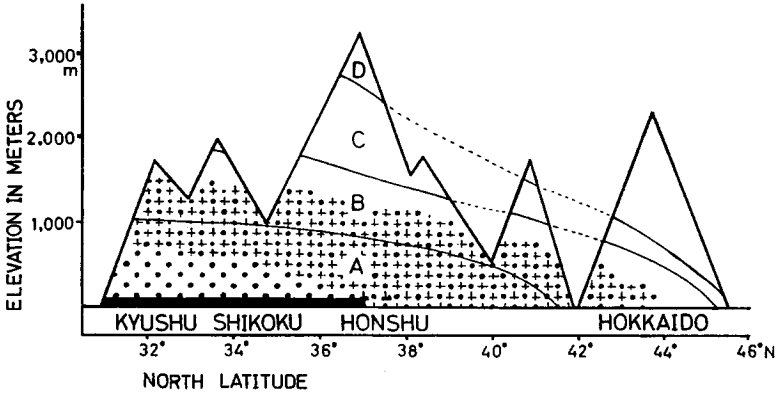

Fig. 2. Vertical distribution patterns of three *Aphaenogaster* ants compared with plant zones in Japan.
A. Basal zone. B. Mountain zone. C. Sub-Alpine zone. D. Alpine zone. ▬ *A. osimensis*, ·····*A. famelica*, +++ *A. smythiesi*.
The northern limit of the distribution of *osimens is*corresponds to the −3.5°C isothermal line at about 37°N, which agrees with the distribution of tropical type I species. Both *famelica* and *smythiesi* have the same upper limit of the vertical distribution agreed with the mountain zone but *smythiesi* does not appear at the level land in the southern part of −3.5°C isothermal line. The distribution pattern of *famelica* is characteristic in the temperate type I species, and that of *smythiesi* does temperate type II.

are found at 600 or 800 meters or higher.

The lowest level where nests are found approaches gradually to the basal zone in more northern part of Japan. It is about 300 meters high in Kyoto and at sea level farther to the north, in Oyashirazu, Niigata Pref., and in Asamushi, Aomori Pref.

Another difference exists in the nesting environment of *famelica* and *smythiesi*. Most of the nests of *smythiesi* seem to be made in field or copse. In spite of a considerable overlapping in horizontal and vertical distribution of both species, there is a segregation in habitat between them. One example was observed at Asamushi where the nests of *famelica* were found in slits of stone walls or under the stones of a pebbly road, but those of *smythiesi* were limited to the soil of copse about a few meters elevated from the coast level. As the latter type of habitat is commonly prefered by ant species centered in cold regions, it may be reasonable to consider that this species, *smythiesi*, is well adapted to a cold environment. It is, however, interesting to note that specimens which are identified morphologically as *smythiesi* are also found in Amami-Oshima, a locality within the margin of the subtropical zone.