Hihara, F. and Kurokawa, H. Tokyo Metropolitan University, Tokyo, Japan.

Relationship between D. funebris and D. multispina.

D. funebris which is known to be a cosmopolitan species has been recorded from both Hokkaido and Honshu in Japan. On the other hand, D. multispina Okada which closely allied to the former species has been collected in Hokkaido only. In some localities in Hokkaido, these two species appear to have close habitats though they discrete microecologically. D. multispina prefers to inhabit forested areas while D. funebris is apt to inhabit domestic environments.

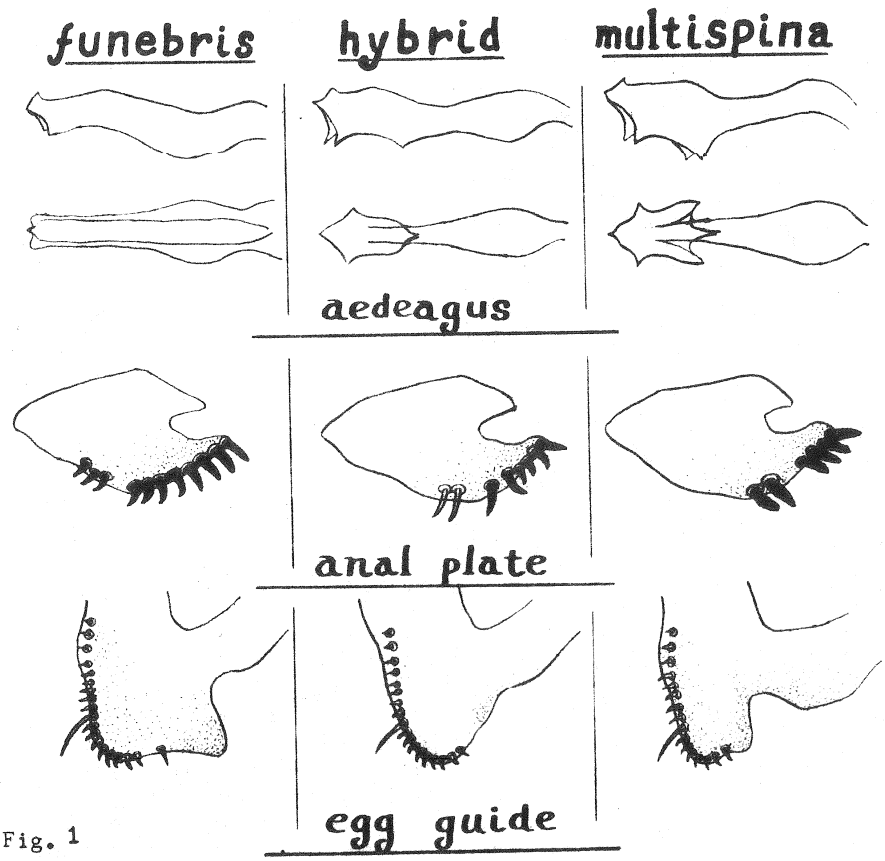


Fig. 1

They are also morphologically similar to each other (Okada, 1956). Only differences in the characters, such as, the shapes of male and female genitalia, and the abdominal sternites were shown (Figure 1). Any difference concerning the ganglionic metaphase chromosomes could not be detected between the two. Sexual isolation experiments were carried out at different temperatures by using male multiple choice technique. The results were summarized in Table 1. In the experiment at 23°C, none of funebris female could be inseminated with multispina male, while a few number of the females carrying alien sperms were seen in the lower temperature at 19°C. It is clear that strong sexual isolation has precluded gene exchange between two species.

Cross experiments between two species were made (Table 2). Hybrid males seemed to be sterile because subsequent backcross experiments using these males were not successful.

Table 1.

| Temperatures | Crosses ♀♀ ♂♂ | Homogamic N | Homogamic %(+) | Heterogamic N | Heterogamic %(+) | $K_{1,2}$ or $K_{2,1}$ | $K_1$ and $K_2$ | $\chi^2$ | P |
|---|---|---|---|---|---|---|---|---|---|
| 23°C | f,m x f | 100 | 74.0 | 98 | 21.4 | 0.702 | 0.851 | 57.95 | <0.001 |
| | f,m x m | 98 | 69.4 | 100 | 0.0 | 1.000 | | 109.79 | <0.001 |
| 19°C | f,m x f | 84 | 97.6 | 73 | 28.8 | 0.833 | 0.869 | 82.09 | <0.001 |
| | f,m x m | 76 | 90.8 | 75 | 10.7 | 0.905 | | 95.17 | <0.001 |

K...Isolation Coefficient
f...funebris, m...multispina

Table 2.

| Crosses 5♀♀ | | 5♂♂ | Pairs tested | No. of offspring ♀♀ | ♂♂ |
|---|---|---|---|---|---|
| f | x | f | 60 | 3140 | 3128 |
| m | x | m | 60 | 1224 | 1303 |
| f | x | m | 200 | 0 | 0 |
| m | x | f | 200 | 677 | 635 |
| (m x f)$F_1$ | x | f | 100 | 2298 | 1792 |
| (m x f)$F_1$ | x | m | 50 | 365 | 301 |
| f | x | (m x f)$F_1$ | 50 | 0 | 0 |
| m | x | (m x f)$F_1$ | 50 | 0 | 0 |