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Differences in the shape of spermatheca of robusta group species in Japan. With one text-figure.

The identification of closely related species may be made by careful examinations of slight differences of external characters. A study of the male genitalia is to be the most satisfactory way to separate the closely related species, while the structure of female ovipositor varies to some extent. The differences in shape of the spermatheca sometimes help in identification of species.

In Japan, Drosophila belonging to robusta group had been divided into the following four species: D. sordidula, D. lacertosa, D. moriwakii and D. okadai. Kaneko, Tokumitsu and Takada separated D. sp. like sordidula from D. sordidula as a new species. Although the two species were very similar in external characters and genitalia, they were different in both karyotypes and sexual isolation. More recently, one more species very close to D. okadai was found by Kaneko, as a new member of robusta group. It is not always possible to identify accurately female members of robusta group, namely D. okadai and D. sp. like okadai, some of D. sordidula and D. sp. like sordidula and D. lacertosa, on the bases of external characters and egg-guide. The shapes of spermathecae in the six species of robusta group as mentioned above, varied remarkably from one another, as shown in the Figure. In living and alcohol-fixed specimens, the degree of transparency in spermathecae of these six species is to be arranged in descending order: 1) D. sp. like sordidula 2) D. sordidula, 3) D. moriwakii, 4) D. sp. like okadai, 5) D. lacertosa and 6) D. okadai. However, the spermatheca of D. okadai is not always transparent. Of course, after preparation (boiling the abdomen in 10% sodium hydroxide, clearing in phenol, soaking in oil of creosote, mounting by balsam), the spermathecae of all species became very pellucid and the internal structure can be easily observed. No apical round hollows were found in D. okadai, D. moriwakii and D. sp. like sordidula. Such differences in spermathecal shape as described above are helpful in identifying the female in robusta group in Japan.

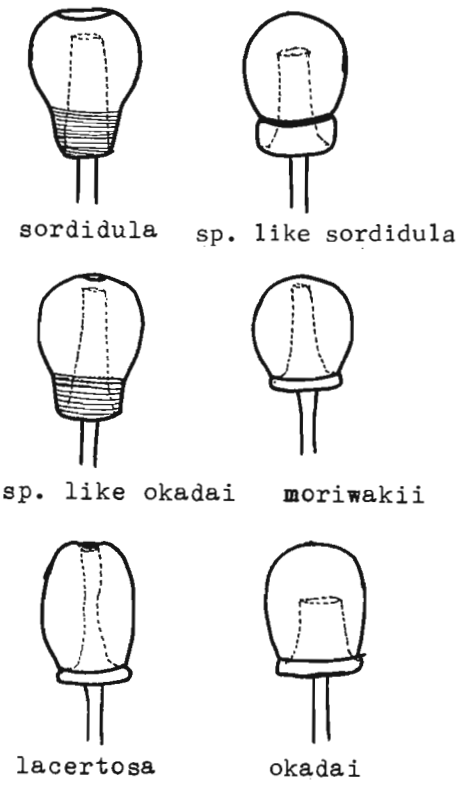

Figure: showing spermathecae of six species in robusta group

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Genetic extent of the deficiencies formed by combining the left end of $In(1)y^4$ with the right end of $In(1)sc^9$.

The salivary gland chromosome break points of $In(1)y^4$ are between 1A8 and 1B1 on the left and between 18A3 and 4 on the right (i.e. = In(1) 1A8-B1;18A3-4). $In(1)sc^9$ is broken between 1B2 and 3 on the left and between 18B8 and 9 on the right (i.e. = In(1)1B2-3;18B8-9). Thus, the recombinant, $In(1)y^{4L},sc^{9R}$ is deficient for salivary bands 1B1 and 2 as well as 18A4 through 18B8.

This recombinant is y (y^{def} or y^4 ?) and ac^{def}, but it survives in combination with l(1) J-1. To check the genetic extent of the proximal deficiency, $In(1)y^{4L},sc^{9R}$ was made heterozygous to the following mutants: fu and fu^{59} (59.5), hdp (59.5), bkl (59.9), obl (60.1), crk (60.1), ton^2 (60.1), bk^2 (60.6), thl (60.7) sby-61 (60.8), pph-61 (61.0), smd (61.1), coc (61.5) and meg (61.9). Mutant phenotypes were obtained only with sby-61, smd, and coc. Thus Df(1)18A4-B8 is approximately one unit long; furthermore the relative position of pph-61 is in error. We wish to express our gratitude to M. G. and O.S. Fahmy for generously supplying us with the selection of mutants that so completely cover this region.