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CHROMOSOMAL POLYMORPHISM IN OKIKURUMINUS ROELOFSI HAROLD (CURCULIONIDAE, COLEOPTERA)

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In a previous paper, Takenouchi (1955) reported that a Japanese weevil species, *Okikuruminus roelofsi* Harold, obtained from Mt. Daisetsu, Hokkaido, had 36 chromosomes in diploid and 18 in haploid. The number of the specimens checked was five males. The sex-determining mechanism was X-y. Since the results were obtained from sectioned preparations, the precise mode of conjugation of the X and y chromosomes was obscure (Takenouchi, 1955). Therefore, this species has been reinvestigated using a modern squash method.

Materials and Methods

Three adult males were collected, one each from: Iwamizawa; Nakagoya, near Tohbetsu; and Ohnomachi, near Hakodate. Testes were squashed using Smith's squash method (1943). The preparations were stained as described by Smith and Takenouchi (1969).

Observations

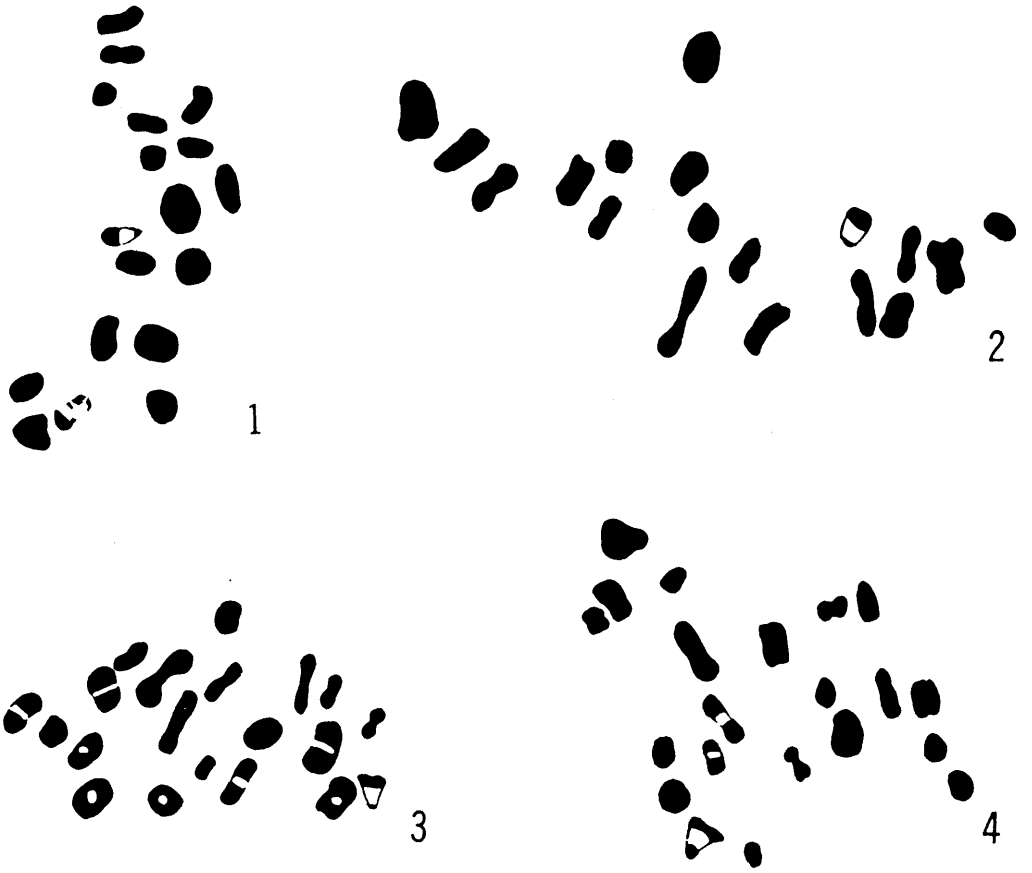
The males with n=18 chromosomes. No spermatogonial metaphases were observed in the specimens obtained from Iwamizawa and Ohnomachi. Many first meiotic metaphases, however, in both males invariably and clearly show 18 bivalents. Seventeen are autosomal and one is the sex-chromosome bivalent associated as a typical parachute (Figs. 1 and 2). Seriation of size is gradual.

The male with n=20/21 chromosomes. The Nakagoya male also had no spermatogonial metaphases but did provide two well spread and apparently intact first meiotic metaphases, one with $19_{II}+Xy_p$, the other $20_{II}+Xy_p$ (Figs. 3 and 4).

Discussion

Variation in chromosome number is very common in parthenogenetic weevil species (Suomalainen, 1954, 1955; Takenouchi, 1969a, 1970). However, it is relatively unusual in bisexual weevil species. For instance, *Phyllobius longicornis* Roelofs and *P. rotundicollis* Roelofs have two chromosome formulae, respectively, $10_{II}+Xy_p$ and $11_{II}+Xy_p$ (Takenouchi, 1958, 1969b), and *Cryptorrhynchus lapathi* Linné, $16_{II}+Xy_p$ and $17_{II}+Xy_p$ (Takenouchi, 1955). Chromosomal dimorphism has also been found in the weevil *Telephae kônoi* Morimoto, which has individuals with $10_{II}+Xy_p$ and $12_{II}+Xy_p$ (Takenouchi, 1972a). Furthermore, different males of an undetermined *Metialma* species are known with 14+, 15+, and $16_{II}+Xy_p$ (Takenouchi, 1958). Recently, intra-individual chromosomal polymorphism was recorded in a male of a *Sitona* sp. (Takenouchi, 1972b). It exhibited three different kinds of cells: $10_{II}+Xy_p$, $11_{II}+Xy_p$, and $12_{II}+Xy_p$. Intra-individual chromosomal polymorphism is very common in dogs (Borgaonkar *et al.*, 1968).

Closely related species of the weevil genus *Pissodes*, often incorrectly identified by museum taxonomists, are known to have different chromosome numbers (Smith and Macdonald, 1972). The same situation may also account for the numerical differences



Figs. 1–4. Chromosomes of *Okikuruminus roelofsi*. 1–2. Iwamizawa and Ohnomachi specimen with 18 bivalents. 3. Nakagoya specimen with 20 bivalents. 4. The same with 21 chromosomes. ×3,600.

noted above in, e.g., *Phyllobius*, with the different specimens representing two biological distinct but morphologically similar species. The *Okikuruminus* investigated here, however, present a more difficult problem. Considering the Iwamizawa — Ohnomachi — Mt. Daisetsu individuals as true *O. roelofsi*, then judging from the only two available cells, the Nakagoya male is not only a representative of a distinct, higher chromosome-numbered taxon, but is also chromosomal mosaic. The different counts presumably resulted from nondisjunction, either of regular chromosomes or else of mitotically unstable supernumerary chromosomes.

Summary

Intra-individual chromosome dimorphism was found in a male identified as *Okikuruminus roelofsi* Harold. The animal contained two different kinds of cells: 19II+Xy_p and 20II+Xy_p although seven specimens, supposedly members of the same species, have 17II+Xy_p.

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