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A natural tetraploid mungbean of suspected amphidiploid origin

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THE mungbean, which is now classified as *Vigna radiata* (L.) Wilczek¹, is considered to be a diploid of $2n = 2x = 22$ chromosomes^{1,2}. Some autotetraploids, however, have been produced artificially by colchicine treatment of seedlings^{3,4}. We would like to report a natural 44-chromosome tetraploid that we identified in material originating from the Philippines.

This plant material was obtained through the Regional Plant Introduction Station at Experiment, Georgia, as USDA P.I. no. 207655. Morphologically the plants were slightly different from other mungbean introductions because the flowers were larger and a deeper yellow, and the seeds exhibited hypogeal germination. Furthermore, this introduction is listed as perennial and indeed we found it to be so under greenhouse conditions. A herbarium specimen was identified by comparison, by a USDA taxonomist at Beltsville, as *Vigna radiata* (L.) Wilczek var. *glabra* (Roxb.) Verdc.

Somatic chromosome counts were obtained from root meristems using the normal Feulgen squash technique following a two-hour pretreatment in a cold saturated aqueous solution of 1-bromonaphthalene. A typical cell of 44 chromosomes is shown in Figure 1A.

Examination of meiosis in pollen mother cells using acetocarmine stain would indicate that this plant could well be an allotetraploid. All the cells examined had 22 bivalents at first metaphase of meiosis (Figure 1B). It is appreciated that this does not rule out the possibility of it being an autotetraploid but the complete absence of multivalents would point to an amphidiploid origin. The exact relationship of this form to the existing diploid cultivars has not been established.

Summary

A natural tetraploid of the mungbean (*Vigna radiata* var. *glabra*) was identified in breeding material from the Philippines. The absence of multivalents at meiosis points to an amphidiploid origin.

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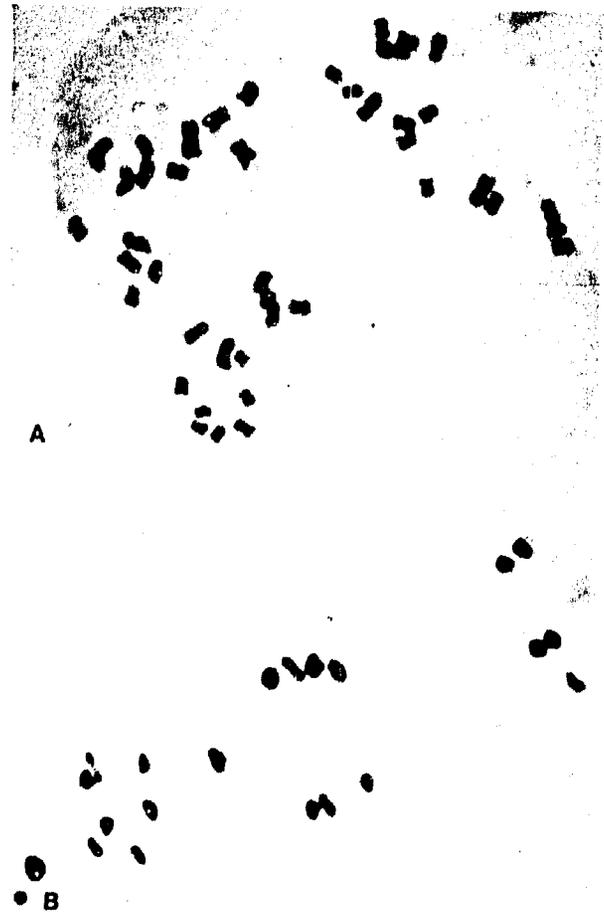


FIGURE 1—Chromosomes of the natural tetraploid $2n=44$ of *Vigna radiata* var. *glabra* (P.I. 207655). A—C-mitosis in a root meristem; B—first metaphase of meiosis in a pollen mother cell showing 22 bivalents.

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