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A binucleate tapetum occurs in *L. hybrida* Michx. and *L. quadriflora* Sims, based on Iowa material. Conclusions of Wunderlich (1954) and Davis (1966) are incomplete and are discussed. Primulaceae is the 12th family of angiosperms with uninucleate as well as bi- or multinucleate taxa.

INDEX DESCRIPTORS: *Lysimachia,* Primulaceae, Tapetum, Tapetal Nuclei.

The Primulaceae consists of 20 genera and about 1000 species (Willis, 1973). Reports of number of nuclei per tapetal cell are available for only two genera. Wunderlich (1954) recorded a binucleate tapetum in *Primula sinensis* Sabine based on Cooper (1933), and binucleate (Thomas, 1931) or "often multinucleate" (Dahlgren, 1916) tapetal cells in *P. officinalis* Hill.

In the most recent compendium of embryological literature Davis (1966) reported that the tapetum is always uninucleate in the Primulaceae. Since references are not usually given for specific statements in her text, it was necessary to document this by consulting most of the almost 30 citations given at the end of her discussion of this family.

The only paper with information on the tapetum was by Raju (1952, incorrectly cited as 1953 by Davis), who reported that in *Anagallis pumila* Sw. "The tapetal cells remain uninucleate throughout and are of the glandular type." Raju's work appeared too late to be cited by Wunderlich (1954), and Davis (1966) overlooked Wunderlich's references. A perusal of Biological Abstracts has not uncovered any tapetal observations since that of Raju. The Primulaceae therefore can be listed as the 12th family of angiosperms in which some taxa have a uninucleate tapetum and other taxa are bi- or multinucleate (Buss, 1971).

We have recently observed tapetal cells in anthers of *Lysimachia hybrida* Michx. and *L. quadriflora* Sims from flower buds collected in late July and early August, 1973, in Dickinson County, Iowa. Voucher specimens were deposited in the herbarium at the University of Northern Iowa. The buds were fixed in 1:3 glacial acetic acid/absolute ethanol, and squash preparations were stained with iron-aceto-hematoxylin (Wittman, 1962).

Only binucleate tapetal cells were seen in both species. Figure one is typical, showing two microspore mother cells in zygotene of prophase adjacent to a smaller binucleate tapetal cell. The tapetum undergoes nuclear division before meiosis begins, and remains binucleate during later stages.

Both *Lysimachia* and *Anagallis* are in the tribe Lysimachiëae, whereas *Primula* is in tribe Primuleae (Willis, 1973). The number of taxa examined in Primulaceae is too sparse as yet to predict any pattern of distribution, but this family, and other families in which different numbers of tapetal nuclei occur, should be surveyed more extensively to find out if any patterns of taxonomic importance exist. A significant pattern has been found among the subfamilies of Leguminosae (Buss, 1971) and there is no reason to believe that tapetal nuclear number will not be of interest in other families when enough observations have been made.

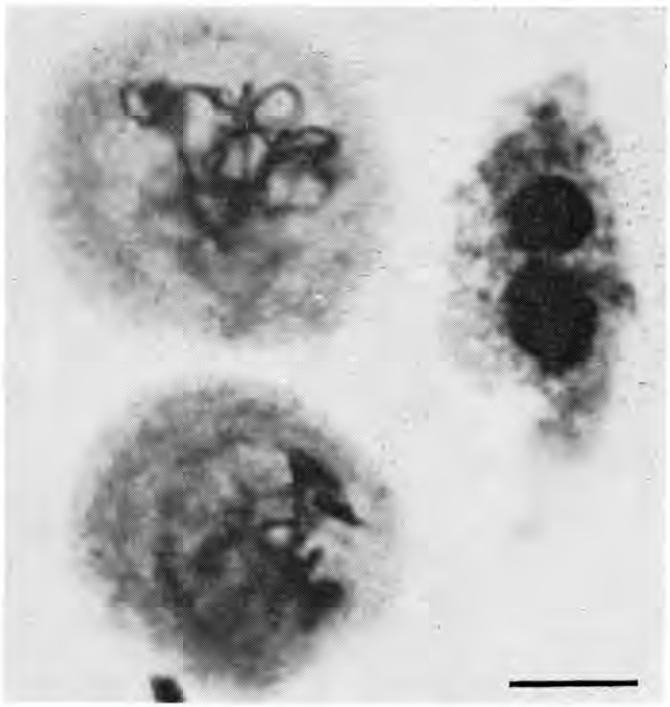

Figure 1. Squash preparation from anther of *Lysimachia hybrida*. The two microspore mother cells at left are in zygotene. Tapetal cell at right is binucleate. Line scale = 10 μm.

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