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Ray R. Hicks Jr.
Stephen F. Austin State University

Johnny C. Jones
Stephen F. Austin State University

Michael H. Cotton
Stephen F. Austin State University

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POLLEN DEVELOPMENT AND RELEASE IN LOBLOLLY AND SHORTLEAF PINE NEAR NACOGDOCHES, TEXAS, 1971

Ray R. Hicks, Jr., Johnny C. Jones

and

Michael H. Cotton[1]

Introgression between loblolly (*Pinus taeda* L.) and shortleaf pine (*Pinus echinata* Mill.) in East Texas is a subject of much speculation (Bilan, 1965; Zobel, 1953). Natural hybridization can occur only if the reproductive phenology of the two species is synchronized to some degree. According to Dorman and Barber (1956), pollen release periods during 1951 extended from March 1 to March 26 for loblolly and from March 20 to April 15 for shortleaf pine in Nacogdoches County, Texas. Both species were releasing pollen from March 20 to 26 that year. The present study examines the timing of microspore development and pollen release of the two species in 1971.

Methods and Results

Twenty sexually mature trees of each species located west of Nacogdoches, Texas were observed weekly from February 12 to April 27, 1971. The color, size and maturity of microsporangiate strobili (male conelets) was noted. In addition, strobili were collected from all trees at

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[1] The authors are respectively Assistant Professor, Student Assistant, and Graduate Research Assistant, School of Forestry, Stephen F. Austin State University, Nacogdoches, Texas 75961.

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each observation and fixed in formalin - acetic acid - alcohol (FFA) for microscopic examination.

Figure 1 shows the period over which pollen was released by each of the 40 trees. Loblolly pollen shed was first observed on March 9 and last observed April 13; corresponding dates for shortleaf pine were March 23 and April 27. On March 30, pollen was being released by two shortleaf and 15 loblolly trees. Since only one observation was made each week, it is probable that the shortleaf pines began to release pollen somewhat earlier than the observation date and the loblolly trees continued a few days longer than observed. Meiotic stages and microspore development of a loblolly and shortleaf tree which had overlapping pollen release dates were closely synchronized (Fig. 2).

Conclusions

In 1971, 10% of the shortleaf pines under observation were producing pollen concurrently with more than half of the loblolly pines. Receptivity of female strobili on a particular tree lags a few days behind pollen shed; shortleaf pollen was available to fertilize loblolly female conelets in 1971 as it was in 1951. Thus, in two different seasons the phenological barrier was not sufficient to prevent natural hybridization between loblolly and shortleaf pine in Nacogdoches County.

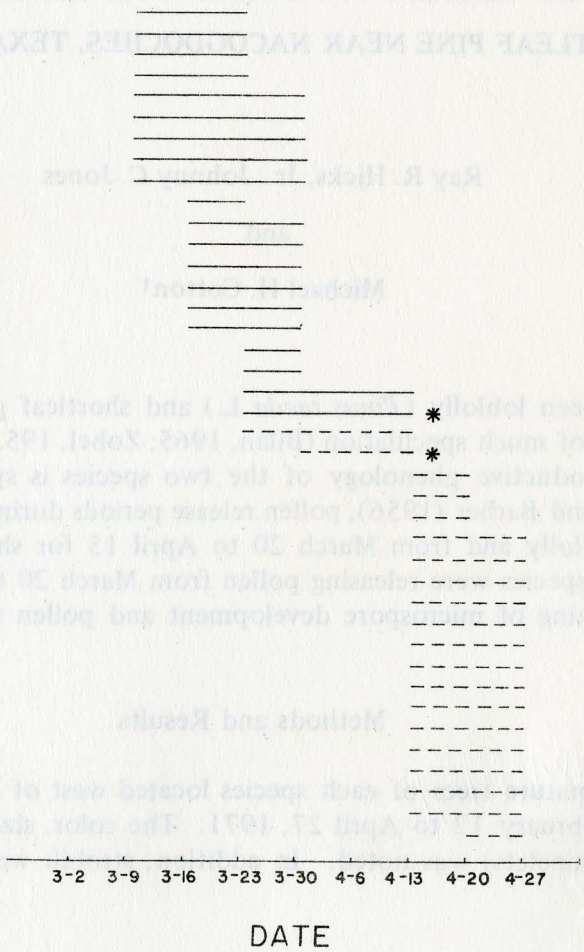

Figure 1. Dates of pollen release for the 40 trees observed. Solid lines denote loblolly and dashed lines shortleaf pines. Asterisks identify the trees whose spore development is shown in Figure 2.

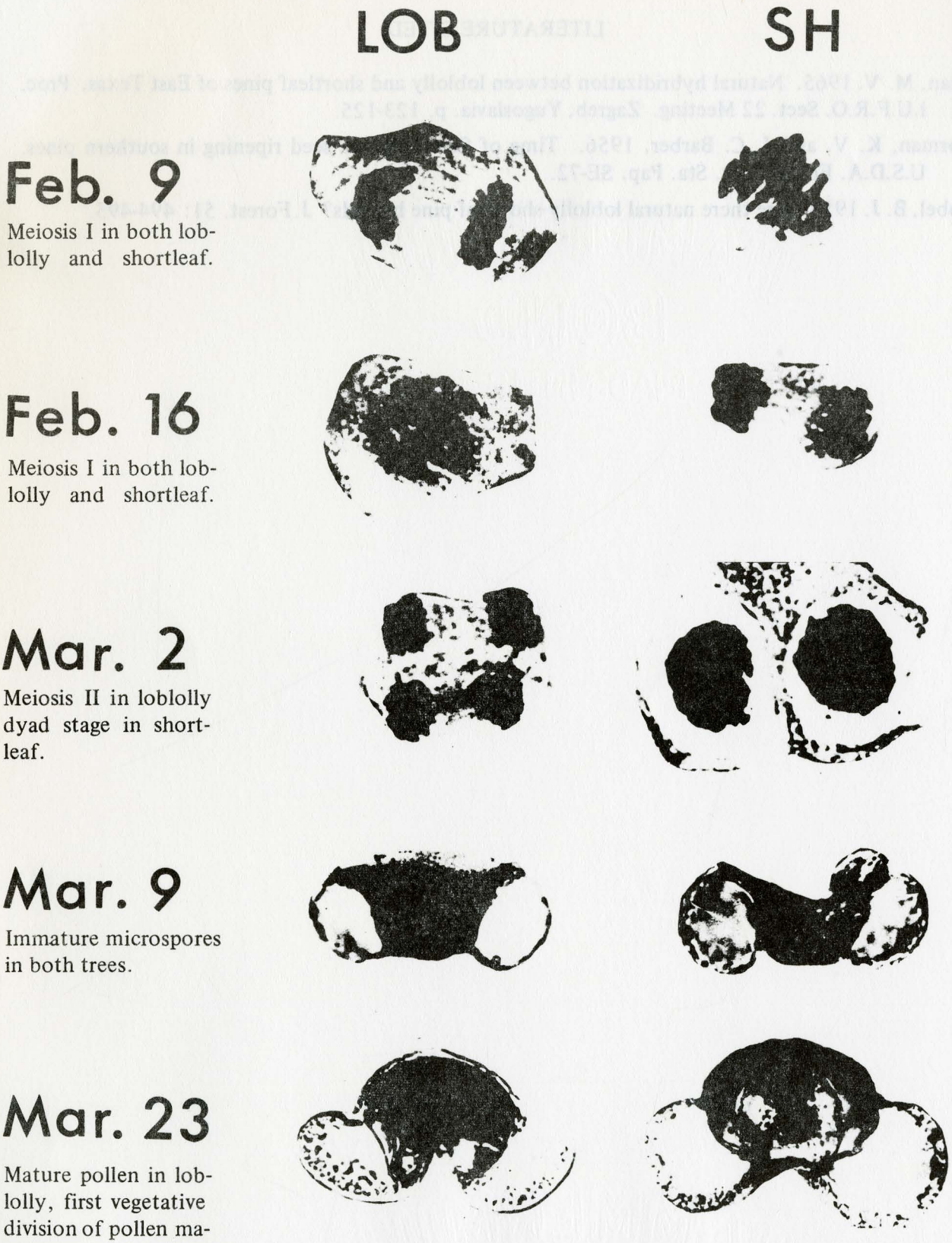

Figure 2. Stages of meiosis and microspore development in a loblolly and a shortleaf pine tree.

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