

Preliminary observations on the developmental curve of pejibaye (*Bactris gasipaes* H.B.K.) inflorescences.

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(Received April 23, 1986)

Resumen: Se midió la longitud de todos los primordios florales dentro de la corona de cuatro plantas de pejibaye. La curva de desarrollo es gradual dentro del palmito y acelera sensiblemente cuando la hoja que subtiende el primordio empieza a fotosintetizar. Las curvas presentan diversas irregularidades, las cuales probablemente representan inflorescencias que abortarán.

The pejibaye palm (*Bactris gasipaes* H.B.K.) is currently the subject of intensive research in Costa Rica, Colombia and Brazil, due to its ample agroindustrial potential (Mora Urpí 1984; Clement & Mora Urpí 1984). In pejibaye, as in all palms, each stem has a single apical meristem responsible for leaf and inflorescence production (Mora Urpí 1984). Between 16 and 24 leaves are produced each year (Sánchez 1981), and each has an inflorescence primordium in its axil (Mora Urpí 1984). In African oil palm (*Elaeis quineensis* Jacq.) these primordia are first visible in the axil of the fourth leaf primordium, while this is still less than one cm in length (Corley 1976). In pejibaye, as in oil palm, a proportion of the inflorescence primordia fail to reach anthesis and abort, due principally to environmental stress and subsequent physiological imbalances in the plant (Corley, 1976). Mora Urpí (pers. com.) observes that this abortion occurs at any of two stages: 1. during initial slow growth within the palmito after the differentiation of the inflorescence has occurred; and 2. during the subsequent stage of rapid growth towards anthesis. This communication presents some data that support this observation.

Several pejibaye trees were cut in the Panamá and Costa Rica Collections at the Centro de Agricultura Tropical de Investigación y Enseñanza - CATIE, in Turrialba, Costa Rica, in June, 1984. The crowns were completely dissect-

ed for a study of leaf development (Clement, in preparation) and in four trees the length of the inflorescence bud was measured at each leaf axil. As these were field observations, microscopic primordia of leaves and inflorescences were not measured.

Table 1 presents the results, with leaf one as the oldest leaf on the plant. The position of the spear leaf is marked with an asterisk (*); this is the most recent leaf to grow out of the palmito stage. Figure 1 presents the plant with the least regular development curve, so as to highlight breaks in the curve.

The inflorescence primordia within the palmito stage are all less than 2.5 cm long in these four plants, with the smallest observed primordium approximately 0.05 cm long. The number of detectable microscopic primordia is probably less than three, if Kaplan *et al.*'s (1982) results can be extrapolated to pejibaye. Inflorescence abortion is unlikely to occur at such an early stage, although it may occur shortly thereafter. The inflorescence developmental curve within the palmito is quite regular in all trees, only 11926/13 (Figure 1) presents a pronounced break in the curve at leaf 21. It is hypothesized that this break represents an inflorescence abortion. There is also a possible abortion in plant 8/9 at leaf 19. The latter break in the curve is less pronounced than the former and may only represent variation in growth rates, rather than abortion.

TABLE 1

*Inflorescence bud lengths within the crown of pejibaye
(Bactris gasipaes H.B.K.)*

leaf number	tree number			
	11924/4	11926/13	11931/9	8/9
1	33.2	10.2	14.1	44.0
2	27.5	12.3	14.0	32.0
3	18.3	11.6	absent	30.0
4	16.0	10.2	8.7	28.0
5	11.5	10.3	8.2	22.0
6	12.0	10.7	5.5	17.0
7	10.5	10.7	6.0	13.0
8	10.0	9.4	5.2	10.0
9	8.8	9.1	4.7	9.0
10	8.5	8.5	4.2	7.0
11	7.3	6.5	3.6	7.0
12	7.0	7.3	3.7	5.0
13	6.3	6.7	3.5	5.0
14	5.3	6.0	3.3	absent
15	5.0	6.3	3.2	3.0
16	4.2*	4.0	1.9*	4.0
17	2.3	3.4	1.5	3.5
18	2.2	2.8*	1.2	2.5*
19	1.6	2.4	1.1	2.0
20	1.1	2.0	0.9	2.5
21	0.9	0.8	0.7	2.0
22	0.6	1.4	0.6	1.5
23	0.4	1.3	0.5	1.5
24	0.3	1.1	0.4	1.0
25	0.2	0.9	0.3	1.0
26	0.1	0.8	0.2	1.0
27	0.05	0.6	0.2	1.0
28	0.05	0.5	0.1	0.5
29		0.3	0.0	0.5
30		0.2	0.05	0.1
31		0.0		0.05

* spear leaf, which is the most recent leaf to develop from the palmito but has not yet expanded.

The inflorescence buds in the axils of the open leaves show increased developmental rates as they get older. This is clearly in preparation for anthesis, and is brought about by increased availability of photoassimilates from the photosynthetically active leaves. All plants show several irregularities in their developmental curves in this growth stage. Some of these may be due to variation in growth rate, caused by seasonal variations in plant physiological condition. The more severe breaks in the curve are hypothesized to be abortions. Plant 11926/13 (Figure 1) presents probable abortions at leaves 1, 4, 5, 11 and 14, with a possible abortion at leaf 6. In Table 1 it may be observed that plant 8/9 shows the most regular developmental curve in this stage, with only one possible abortion at leaf 15. Plants 11931/9 and 8/9 present one

leaf each where no bud was found. This suggests abortion in the palmito stage.

From these data it is clear that the inflorescence has two principal growth stages during its development, which seem to be intimately related to leaf growth. Stage 1 extends from initiation until the leaf that subtends it grows beyond the palmito stage. Abortion is possible at this stage, but appears to be less frequent, probably due to the very small use for photoassimilates by the inflorescence. Stage 2 extends throughout the period of fast inflorescence growth until anthesis, which occurs when the subtending leaf is senescent or already dead (Mora Urpí, 1984). There is a greater probability of inflorescence abortion during this stage. In fact, it is common to find large (05-25 cm) aborted buds in the axils of dead leaves below the crown,

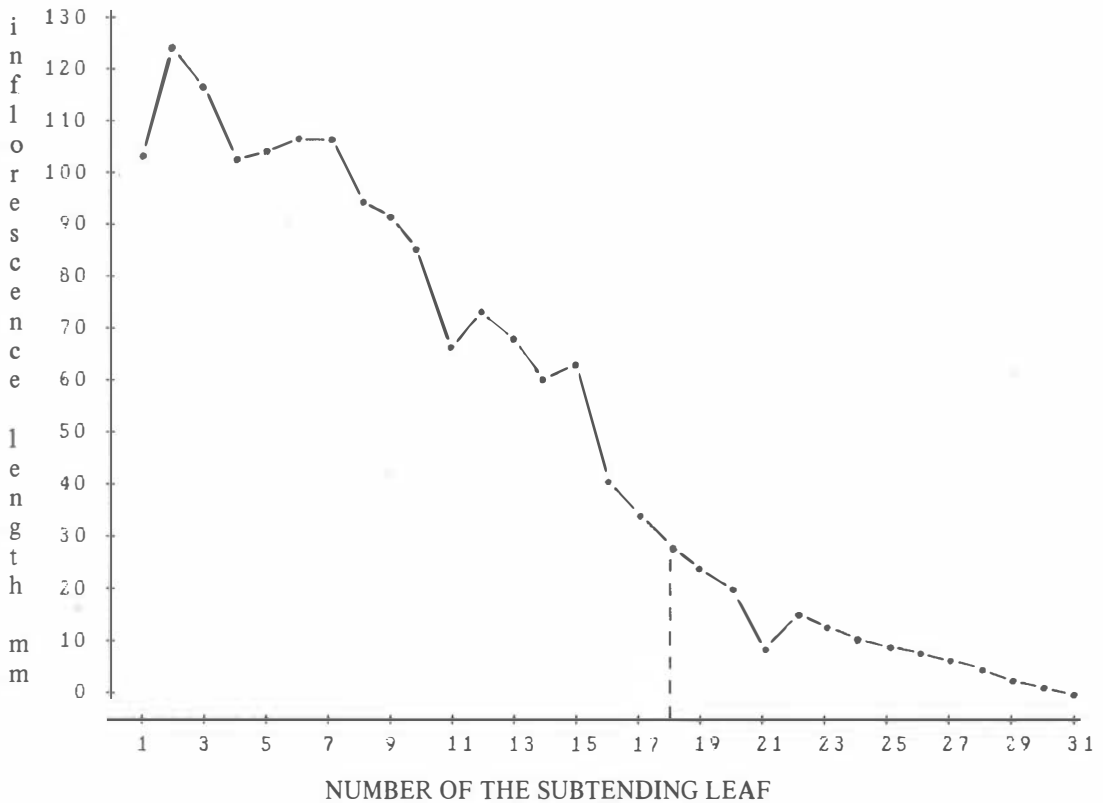


Fig. 1. Developmental curve of inflorescence primordia and buds within the crown of pejibaye (*Bactris gasipaes* H.B.K.), plant number 11926/13, Panamá Collection, CATIE, June, 1984.

* spear leaf, which is the most recent leaf to develop from the palmito.

which suggests that this is the principal abortion stage. These data support Mora Urpi's observations on the occurrence of inflorescence abortion in pejibaye.

ACKNOWLEDGMENTS

Thanks are due to the Unidad de Recursos Genéticos of CATIE for permission to cut in their collections and for the assistance provided by their field team.

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