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## Observations on Abnormal Developmental Patterns of Axillary Buds in Date Palm (*Phoenix dactylifera*)

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### ABSTRACT

Two patterns of probably advanced development of mixed axillary buds in date palm, *Phoenix dactylifera* L., cultivar 'Mishrig Wad-Khatib' are reported. It appears that this cultivar is particularly prone to produce abnormal shoots and would repay further studies on such developmental patterns.

Studies on axillary buds of the date palm, *Phoenix dactylifera* L., were initiated by Faris in 1932 (Faris 1932). However, further studies are few despite the importance of axillary buds in date palm yield and conventional vegetative propagation or in vitro micropropagation (Bouguedoura 1982, Booiij et al. 1993). Reuveni et al. (1974) recognized the presence of distinct vegetative and inflorescence buds in date palm. Recently four types of axillary buds are recognized in the date palm—vegetative, fertile inflorescence, sterile inflorescence, and mixed buds, which show the morphological characters of the first two types (Bouguedoura 1982). The palm produces most of the vegetative buds during its early stage of growth (youth stage) (Bouguedoura 1980, 1982). During this stage the mixed buds are also produced although in a low frequency (1%) (Bouguedoura 1980, 1982). Fertile inflorescence buds are produced during the mature reproductive stage but some vegetative buds may develop in this stage and grow into offshoots (high offshoots).

### Observations on Developmental Patterns of Mixed Axillary Buds

This note reports two developmental patterns of lateral growth in date palm, cultivar 'Mishrig Wad-Khatib' that probably resulted from the development of mixed axillary buds.

Fig. 1 shows a lateral growth on a young, fruiting, date palm with vigorous growth, cultivar 'Mishrig Wad-Khatib', 50 cm above the soil level. Dissection from the base shows that there were

full-grown prophyll-like bodies packed one within the other. Leaflets were recognized on the outer bract-like bodies. The lateral growth thus resembles an offshoot.

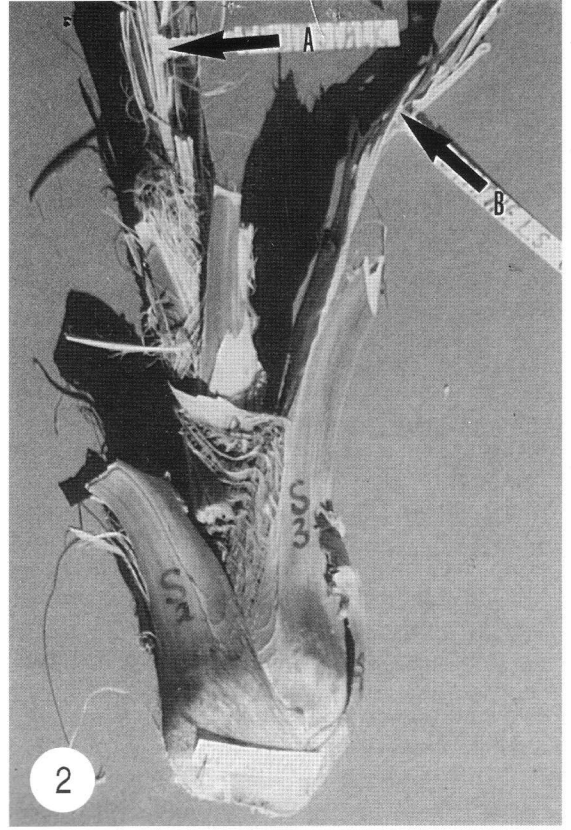
Up to this stage this description resembles what was reported by Davis (1967) on coconut and described as inflorescence growing into simple shoots. However, Figure 1 shows further development as the central growth, inflorescence-like structure, terminated in a narrow growth that carried out of season flowers then parthenocarpic fruits. No development of rachillae was recognized. Bouguedoura (1988) (pers. comm.) stated that she observed a date palm bract that enclosed developing leaves and suggested that the above phenomenon may represent an advanced stage of development of a mixed axillary bud, which gives rise to leaf-like structure followed by flowers and fruits.

Figure 2 shows another developmental pattern of a lateral growth on the same date palm cultivar. Dissection shows that true leaves were produced first followed by the development of bract-like structures and a terminal inflorescence-like structure showing flower sites. The axillary bud subtended by leaf number (3) developed into a bract-like structure.

This phenomenon is well known to local date palm growers in the northern region of Sudan. They describe the above lateral growth as an aborted offshoot and often discard it. They acknowledge its occurrence in high frequency in this cultivar in particular.

### Discussion

The common position of vegetative and inflorescence buds in palms is axillary (Fisher and Dransfield 1978). In palms each offshoot is of unlimited growth and not terminated by flower or



1. Axillary growth in date palm. (A) Outer bract-like body terminated with leaflets. (B) Inflorescence-like structure bearing parthenocarpic fruits. 2. Axillary growth in date palm. (A) Terminal inflorescence-like structure. (B) Bract-like body in the axil of the third leaf.

inflorescence (Moore and Uhl 1982). The two developmental patterns described above are contrary to the normal pattern of shoot growth in date palm. The position of these abnormal growths on the palm was consistent with the statement of Bouguedoura (1980) that mixed axillary buds are produced during the vegetative stage of the palm growth. If the origin of this lateral growth is a mixed axillary bud, these observations indicate different developmental patterns of mixed axillary buds. The date palm cultivar 'Mishrig Wad-Khatib' is a suitable cultivar for further studies on mixed axillary buds.

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