FOSSIL PALM REMAINS FROM BOMMURU, ANDHRA PRADESH

T. S. MAHABALE AND S. VENKATESWARA RAO
Department of Botany, University of Poona, Poona-7, India

BOMMURU is a small village about 3·5 miles S.E. of Rajahmundry in Andhra Pradesh. It is surrounded by low plateau hills sedimentary in origin, made up of soapy clays and shales of current bedding with white, yellow, and pinkish layers. They form the Upper Series of Rajahmundry sandstones King,[1] 1880, p. 250). They lie uncomfortably over the Deccan Traps in this area. They have a low dip, 8–10° towards South (Krishnan *et al.*,[2] 1962, p. 662). They are equivalent of Cuddalore Series in South Arcot District of the Madras State (King,[1] 1880, p. 152; Pascoe,[3] 1963, p. 1879; Krishnan *et al.*,[2] 1962, p. 65).

On the basis of their deposition over the Deccan Traps, the age of these formations is given as Middle Eocene (King,[1] 1880, p. 252), or Miocene-Pliocene (Krishnan,[4] 1956, p. 513), or Oligocene-Miocene (Mahabale,[5] 1966, p. 23). But no animal or plant fossils from this area at Bommuru were described in support of these views.

Several impressions of palm and other remains were collected by us at Bommuru on pink, yellow and white current bedding shales, the more important of which are described below :

1. *Specimen No. B. 47/63.*—This has the impressions of two leaflets of a pinnate palm on a light pink shale. One of them is preserved in parts. It is 9 × 3 cm. and shows clearly even minute details of venation (Fig. 1). It has a moderately thick midrib, 1–1·5 mm. with 9–11 other veins of the first order parallel to it on either side. They are less conspicuous than the midrib. The veins of the second order arise laterally from them at right angles and are wavy. The veins of the second order give rise to smaller veins of the third order and are inter-connected. They are very thin and are more or less parallel to the long veins of the first order. Comparing this venation pattern in the leaflets on the specimen, it seems to resemble very closely with the venation in the leaflets of the pinnæ in *Cocos nucifera* L. (Fig. 2).

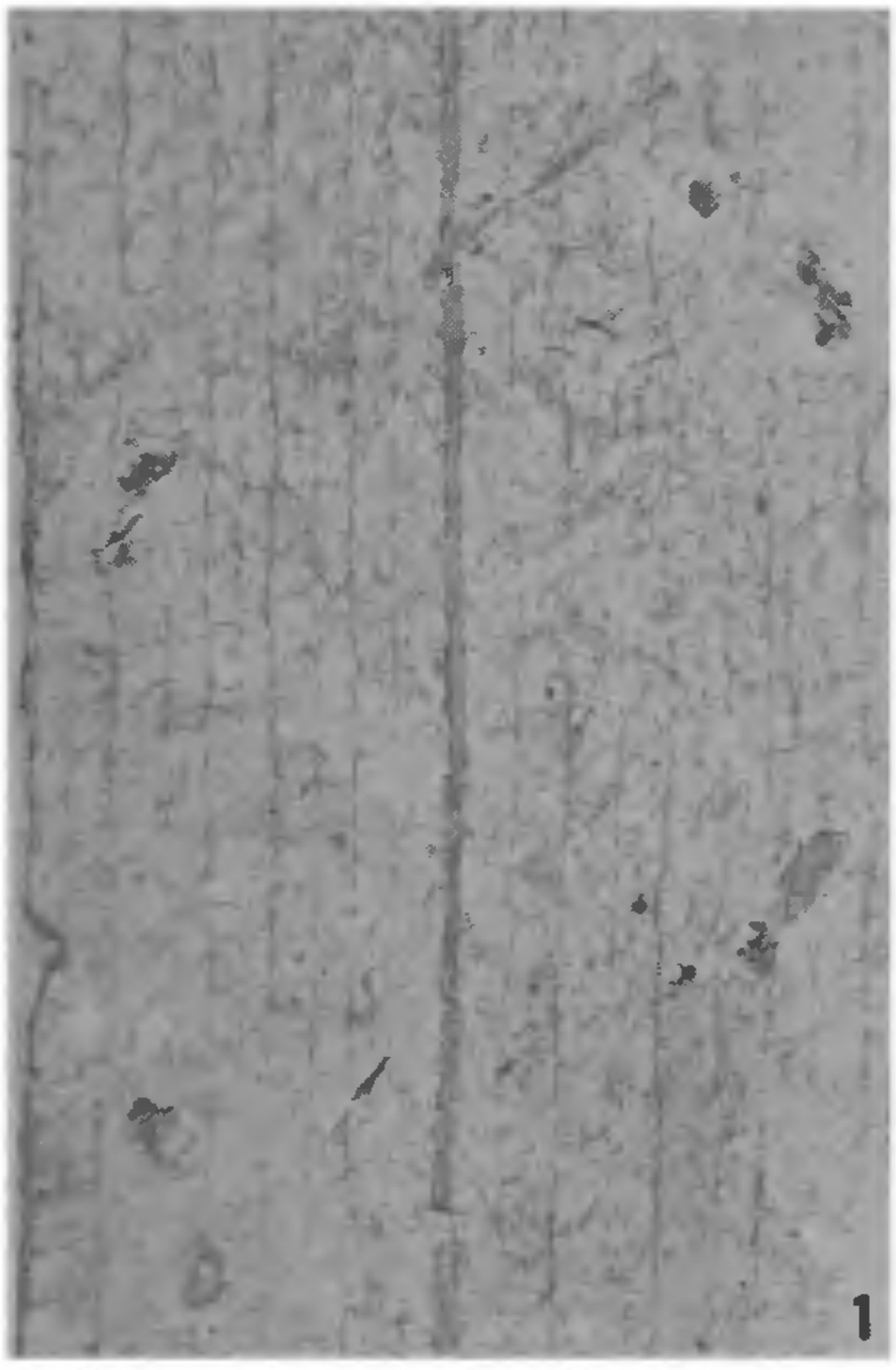
2. *Specimen No. B. 61/63.*—This has impressions of two leaflets of another palm leaf on a pink shale, preserved in part. They are 18 × 4·5 cm. respectively (Fig. 3). There is a thick midrib, 4 mm. The margin is entire and smooth. Venation is parallel, though rather faint. There are 11–13 such veins parallel to midrib. Some of the parallel veins are thicker than others. This specimen differs from the previous one in this character. The parallel veins of the first order in specimen No. B. 47/63 are thick uniformly, but in this specimen they are not of uniform thickness.

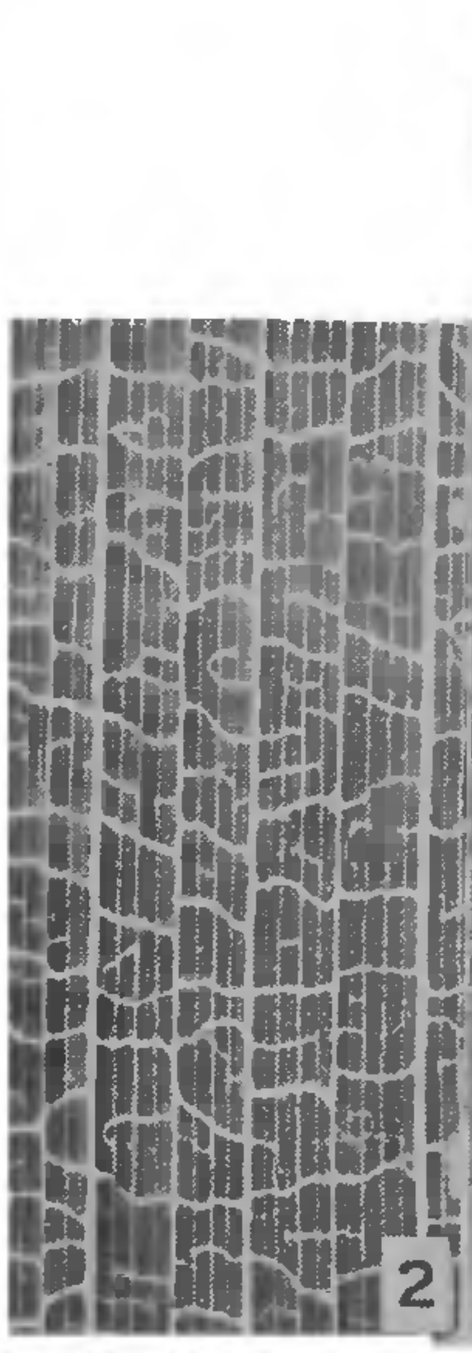
3. *Specimen No. B. 73/63*—shows a part of Impression of a leaf on pale yellow shale. It is 16 × 17 cm. and consists of fan-shaped part of a palm leaf probably above hastula in a palmate-leaved palm (Fig. 4). The individual leaflets are 6 in number, 2–3·5 cm. broad, each with a midrib 1 mm. thick. Other details are not well preserved.

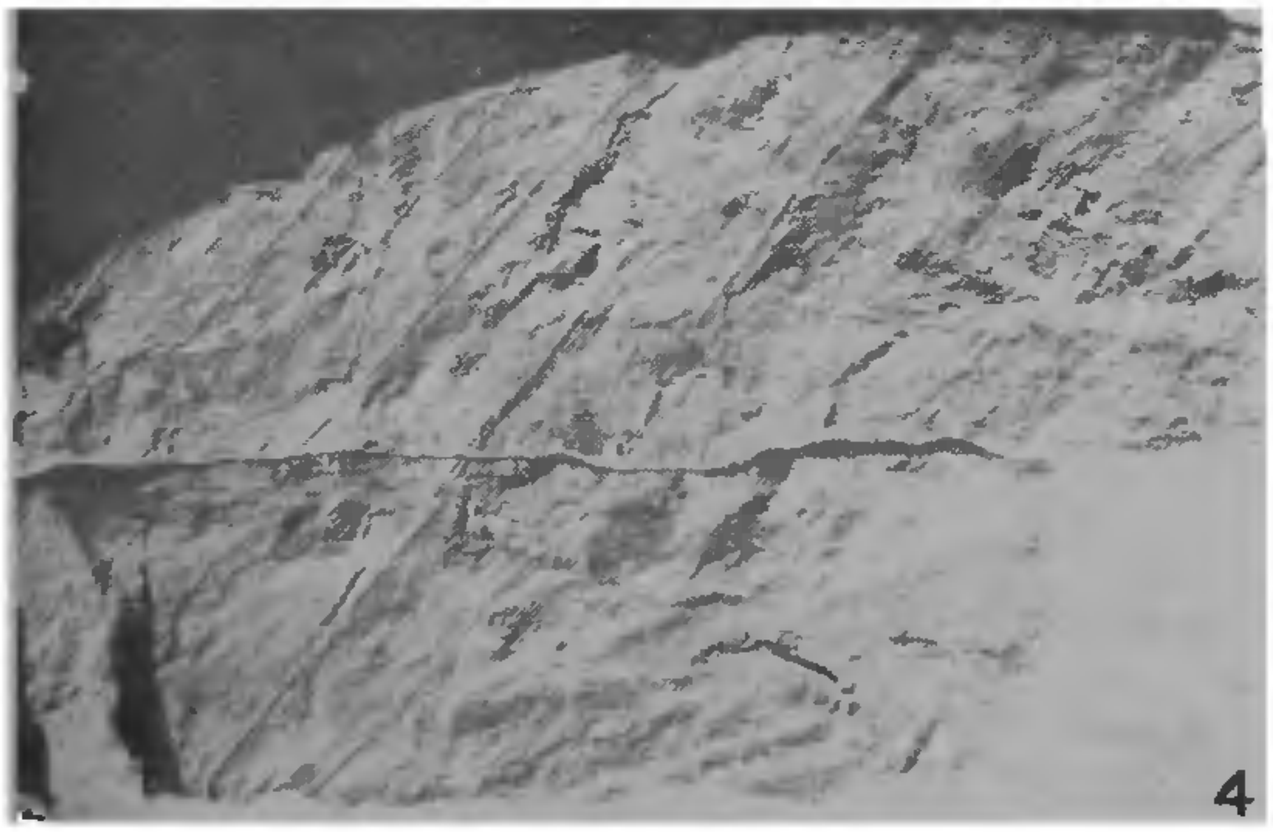
4. *Specimen No. B. 60/63.*—This is an impression of a small palm-fruit on a white shale (Fig. 5). It is 1·5 × 1·3 cm., oval in shape with concave attachment at the base, and has a broadly rounded tip. The fibres of the mesocarp are seen in the impression to pass from base to the apex of the fruit. In shape and size, this palm fruit resembles the fruits of a small-fruited species of *Cocos*, like *C. plumosa*, *C. coronata* and others. Presumably it belongs to some such members of that genus or a related palm having small fruits, but not to the large-fruited one as *C. nucifera*.

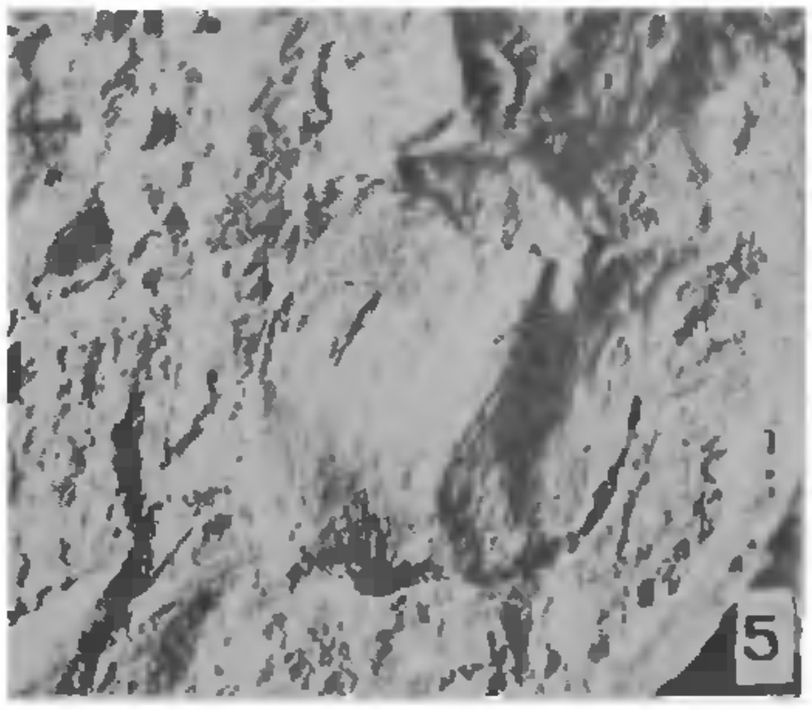
Some dicot leaf impressions were also collected which are under study.

These fossil palm remains in this area are rather unique and support the view of Mahabale[5] (1966, p. 21) that different species of palmate and pinnate palms enjoyed a wide range of climate and distribution in the Tertiary period in India, as also elsewhere. They also provide palæobotaincal evidence for the age of these formations, *viz.*, Rajahmundry sandstones at Bommuru as late Tertiary, since the Rajahmundry Traps below are generally believed to be of the early Tertiary period, probably Eocene (Pascoe,[3] 1963, p. 1383; Sahni,[6] 1940, p. 21; Rao, L. R. *et al.*,[7] 1936, p. 161).









FIGS. 1-5. Fossil palm remains at Bommuru. Fig. 1. A part of a fossil palm leaf impression No B. 47/63 × 2. Fig. 2. Venation in a pinna of *Cocos nucifera* leaflet, × 2. Fig. 3. Two fossil palm leaf impressions No. B. 61/63, × ½ Fig. 4. Impression of a part of palmate palm leaf No. B. 73/63, × ½. Fig 5. Impression of a fossil palm fruit No. 60/63, almost natural size.

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