

rays 1-5 (mostly 4-5) seriate (Fig. 2), and 12-75  $\mu$  broad, 7-10 per mm.; ray tissue homogeneous to weakly heterogeneous with rays composed mostly of procumbent cells (Fig. 2). Fibres libriform, very thick-walled with small lumina, non-septate, and polygonal in cross-section. Gum canals vertical, arranged in 1-3, rarely 4 tangential rows (Fig. 1), embedded in parenchymatous tissue, round to oval, 45-150  $\mu$  in diameter.

Birbal Sahni Institute of Palaeobotany,  
Lucknow (India), November 9, 1964.

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### **PALMOCARPON LESQUEREUX AND ITS SYNONYMY WITH PALMOCARPON MIQUEL**

In the literature on fossil palm fruits one comes across two names, viz., *Palmocarpum* Miquel and *Palmocarpum* Lesquereux.<sup>2</sup> Miquel instituted the genus *Palmocarpum* in 1853 for some palm fruits from the Upper Cretaceous of Limburg in Belgium and defined it as "*Fructus ellipsoideus trigonus utrinque acutus, centro tumidus, pericarpio crasso?, extus longitrose tenuiter striulato, angulis versus basis et apicem acutatis sulcatisque*".

Perhaps unaware of this prior use of the generic name *Palmocarpum* by Miquel, Lesquereux also instituted the genus *Palmocarpum* in 1878 for some palm fruits from the Tertiary of New Mexico. The definition of his genus *Palmocarpum* reads as "*Fruits of various sizes and forms, generally surrounded by a shelly pericarp, and found in connection with remains of palms*".

The two homonyms are also synonyms. The only difference between the two is that the latter is from the Tertiary while the former belongs to Upper Cretaceous. This is an insufficient reason for maintaining both the homonyms and is also against the *International Rules of Botanical Nomenclature*.<sup>3</sup> The latter homonym, *Palmocarpum* Lesquereux, should therefore be rejected in favour of *Palmocarpum* Miquel which obviously has priority.

Birbal Sahni Institute of Palaeobotany,  
Lucknow, November 2, 1964.

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### **NOTE ON A NEW SPECIES OF FOSSIL FROG FROM THE INTERTRAPPEAN BEDS OF MALABAR HILL, BOMBAY\***

A NEW species of fossil frog, *Indobatrachus malabaricus*, has been collected by the author from the Intertrappean Beds exposed at the foot of the Malabar Hill, west of Chowpatty Bunder, Bombay. These fossils occur in dark grey to bluish-grey argillaceous rock with very thin black shaly partings and have been found to be associated with ribbed fragments of plants and large pieces of carbonised matter.

The fossil frogs have been known to occur in the Intertrappean Beds of Bombay for a long time but they were described first by Owen (1847) as *Rana pusilla*. Later Wynne (1869), Stoliczka (1869), Ribeiro (1921), Noble (1930) and Chiplonker (1941) recorded their occurrence from the same beds of Bombay. Noble (*op. cit.*) created a new genus, *Indobatrachus*, for all the fossil frogs of Bombay Intertrappeans.

A brief diagnosis of the present species is given below: Head large, anteriorly rounded off, broader than long; teeth on maxillaries, premaxillaries and vomers; nasal and parietal present; fronto-parietal separated by a broad median fontanel; ethmoid broad; squamosal small; vertebral column with nine pro-coelus vertebrae having well-developed zygapophyses; sacral vertebra with dilated diapophyses and followed by a slender bony rod, coccygeal style; vertebral column two and half times longer than coccygeal style; terminal phalanges long and tapering; humerus almost as long as supra-scapula; radius and ulna fused; tibia and fibula fused; femur always a little longer than the tibio-fibula; head of the femur like a ball; pelvis less than half of the length of the vertebral column.

The most striking feature of the present species is that its vertebral column is always more than twice the length of the pelvis. Ratio of the length of the vertebral column to that of the pelvis is 213-18/100 while it is 181-83/100 and 153/100 in *Indobatrachus trivialis* Chipl. and *I. pusillus* (Owen), respectively. The other



major difference is that while in the present species the femur is always a little longer than tibio-fibula, it is either equal to or a little less than the latter in the other two species. The other differences are in the ratios of length of the head to its width and the length of the hind limb to the length of the body. The former ratios are 81-82/100, 94-95/100 and 97/100, and the latter ratios are 147.75/100, 134-36/100 and 135-38/100 in the present species, *I. trivialis* Chipl., and *I. pusillus* (Owen), respectively. These differences in the three species of fossil frog mentioned above do not appear to be due to the different growth stages of a single species.

In view of the above considerations the present species appears to be entirely different from the earlier described ones, hence a new name, *Indobatrachus malabaricus*, is proposed. The specific name is after the locality of its occurrence, the Malabar Hill, Bombay.

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#### OCCURRENCE OF ANTIGENIC VARIATION IN *BORELLIA* *GALLINARUM* SPECIES

LITERATURE on the antigenic variations among *Borellia gallinarum* is very scarce. We prepared two small batches of formalised egg-grown fowl spirochætosus vaccine using an imported Australian strain. The batches were subjected to necessary sterility, safety and potency tests. Four fowls were injected each with 3.0 ml. and

8 fowls each with 1.0 ml. of the vaccine intramuscularly. Three weeks after vaccination the fowls were divided into two comparable groups and along with controls were challenged with fresh Australian and an Indian field strain of *Borellia gallinarum*. The challenge dose was fixed at 0.5 ml. of the infected fowl blood showing teeming Spirochætes of Australian as well of the Indian strain. In case of Australian strain it was worked out that the challenge dose consisted of at least 100 m.i.d.s.

Our observations are summarised as follows:

(a) The vaccine was non-toxic and did not produce any shock even at 3 field doses when inoculated intramuscularly in healthy cockerels of 12 weeks of age.

(b) The vaccine afforded solid immunity against Australian strain of organisms.

(c) When the vaccinated fowls were challenged with the Indian strain of organisms, there occurred a breakdown of immunity in 3.0 ml. and 1.0 ml. dose vaccinated groups. Therefore there seems to be a certain degree of aberrant variation in the antigenic make-up of the two strains of organisms under study. This observation has been noted in both the sets of experiments. The percentage of breakdown ranged from 40% to 60%. This observation has therefore a direct bearing on any programme for production of vaccine.

Conversely we prepared a small batch of formalised egg-grown fowl spirochætosus vaccine using the Indian field strain of fowl Spirochætes and after the completion of the necessary safety, sterility tests, the batch of vaccine was subjected to potency test. Six fowls of 12 weeks of age were injected each with 3.0 ml. and 10 fowls each with 1.0 ml. of the vaccine intramuscularly. Three weeks after vaccination the fowls were divided into two comparable groups and along with necessary controls were challenged with Australian and Indian strain of *Borellia gallinarum*. The Challenge dose for Australian strain was fixed at 0.5 ml. of the infected fowl blood and for the Indian strain an arbitrarily fixed dose of 1.0 ml. to contain 100 m.i.d.s was employed as the multiplication of the organisms in healthy susceptible fowls was rather erratic.

Our observations are summarised as follows

(a) The vaccine was non-toxic and did not produce any shock even at 3 field doses.

(b) In case of the groups challenged with Australian strain of Spirochætes a complete breakdown in immunity was noted in 1.0 ml. vaccinated lot. In the case of 3.0 ml. vaccinated