## POST-PARTUM ŒSTRUS IN THE INDIAN SHORT-NOSED FRUIT BAT, CYNOPTERUS SPHINX SPHINX (Vahl.)

*Nycteris luteola* (Thos.) appears to be unique among insectivorous Cheiroptera in experiencing a post-partum œstrus with at least two and possibly three pregnancies occurring in quick succession. Harrison Matthews[1] suggests that the above species may be polyœstrous.

Braestrup[2] considers it probable that in Tropical Africa insectivorous bats have two breeding seasons in the year. Do the Cheiroptera breed twice in the tropical Indian climate?

Our information on the reproduction of fruit bats reveals that most forms have definite breeding seasons characteristic of the species. Bakers'[3] comprehensive list on Pteropidæ indicates that they are monœstrous.

Phillips[4] observed in the Indian Short-nosed Fruit bat, *Cynopterus sphinx sphinx* (Vahl.) from Ceylon, females with young during most months of the year, and remarks that the breeding is probably intermittent throughout the year.

My observations on *Cynopterus sphinx sphinx* (Vahl.) reveal that there is post-partum œstrus and that at least two pregnancies occur in quick succession. Four adult specimens were obtained at Malleswaram (Bangalore), and three at Hoskote (sixteen miles from Bangalore) all of which while in lactation, and with young ones still clinging to the nipples were at the same time pregnant. The collection from each one of these places included also an adult male which was in full functional activity.

The period of gestation in *Cynopterus sphinx sphinx* (Vahl.) is about five months, while the period extends to six months (Baker and Barker[3]) and sometimes exceeds it (Ratcliffe[5]) in the other Megacheiroptera. Pregnancy alternates between the two horns of the uterus and the ovaries function alternately. Sections of the ovaries show that the corpora lutea persist till parturition.

The available information indicates that this species differs from all other Megacheiroptera in experiencing a post-partum œstrus and that two pregnancies occur in quick succession in the month of April. The comparatively long gestation period of about five months precludes any possibility of this species being polyœstrous.

This is perhaps the first record of a Fruit Bat breeding twice a year.

Department of Zoology,
Central College,
Bangalore, P. A. RAMAKRISHNA.
*June* 9, 1947.

1. Matthews, L. Harrison, *Nature*, 1939, 143, 643 and *Proc. Zool. Soc. Lond. Ser.* B., 1942, **111**, 289–346. 2. Braestrup, F. W., *Ann. Mag. Nat. Hist.*, 1933, Ser. 10, **11**, 269. 3. Baker, J. R. & Z. Baker, *Journ. Linn. Soc. Zool.*, 1936, **40**, 123–41. 4. Phillips, W. W. A., Mammals of Ceylon, *Ceylon. Journ. Sci.* 1935. 5. Ratcliffe, F., *Journ. Anim. Ecol.*, **1**, 32.

* I am very thankful to Dr. B. R. Seshachar, Central College, Bangalore, for encouragement and to the Council of the National Institute of Sciences (India) for the award of a Junior Research Fellowship.

## ELECTROLYTIC REDUCTION OF *m*-NITRANILINE TO 2, 4-DIAMINOPHENOL

2, 4-DIAMINOPHENOL which is a valuable photographic developer, has been prepared from various starting materials derived from benzene. It has been obtained from 2, 4-dinitrophenol both by chemical[1] as well as by electrolitic methods,[2] and also by the electrolytic reduction of *m*-dinitrobenzene in strong sulphuric[3] acid.

The only reference in literature to the production of 2, 4-diaminophenol from *m*-nitraniline is that of Gattermann[3] who used a platinum cathode in the presence of strong sulphuric acid. The yield obtained by him was, however, not specified.

The electrolytic reduction of nitrobenzene to *p*-aminophenol in dilute sulphuric acid emulsion has been studied in this laboratory[4] on a pilot plant scale, and a patent[5] has also been taken out for the process. In a later publication from this laboratory,[6] the electrolytic reduction of *m*-dinitrobenzene directly to 2, 4-diaminophenol in dilute sulphuric acid emulsion using certain catalysts has been reported. The process has now been extended to the production of 2, 4-diaminophenol by the electrolytic reduction of *m*-nitraniline.

*m*-Dinitrobenzene and *m*-nitraniline which were required in large quantities and in a high state of purity were prepared in this laboratory on a pilot plant scale following the procedures already reported in literature, and obtained in very satisfactory yields.

2, 4-Diaminophenol has been isolated as the sulphate in the crude condition, and has been obtained in the pure condition as the insoluble oxalate.[7] By electrolysing *m*-nitraniline in 30 per cent. sulphuric acid at a monel cathode using a suitable catalyst and a current density of 2·3 amps./sq. dm., the yield of the crude sulphate amounts to 56 per cent. and the yield of diaminophenol oxalate to about 50 per cent. The diaminophenol sulphate obtained by this procedure is purer than that obtained directly from *m*-dinitrobenzene and this promises, therefore, to be a much better process for the manufacture of this important chemical on a technical scale.

Further experiments are in progress to improve the yield with special reference to the influence of such factors as current density, strength of catholyte temperature, cathode materials, catalysts, etc., on the material yields of the products. Fuller details of this investigation will be published elsewhere in due course. Our grateful thanks are due to the Council of Scientific and Industrial Research for kind permission to publish the preliminary results.

B. B. DEY,
H. VENKATARDHANA UDUPA,
B. R. PAI.

Presidency College,
Madras,
*May* 3, 1947.

1. Bradt, *J. Phys. Chem.*, 1930, **34**, 2711. 2. Weyprecht, *Dissert.*, Giessen (1902). Brockman's *Electro Organic Chemistry*, 1926, pp. 254–6. Ellis, *J. pr.*