Fossil leaf of *Clinogyne* Salisb. from the Siwalik sediments of Darjeeling District, West Bengal

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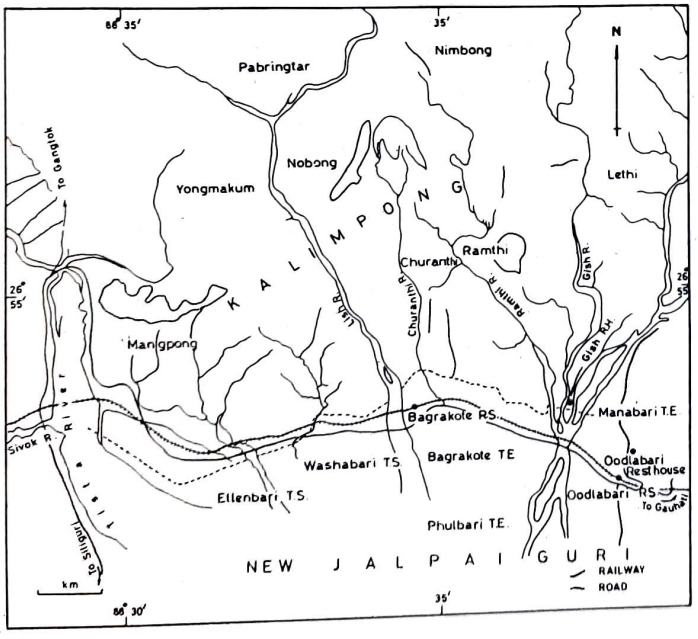
THE Siwalik sequence in this area is broadly divided into Lower, Middle and Upper Siwalik Members. The Middle Siwalik is well exposed in Ghish, Ramthi and Lish river cuttings. These sediments are characterised by thick sandstones over shaly and clayey beds (Acharyya, 1972).

A number of fossil leaves have already been described from the Siwalik sediments exposed in Ghish, and Ramthi rivers (Antal & Awasthi, 1993). Recently a number of well-preserved leaf-impressions have been collected from a new locality exposed in Lish River near Bagrakote in the foot-hills of Darjeeling District (Map 1). The critical study on these fossil leaves enabled us to identify with that of extant *Clinogyne dichotoma* Salisb. which is being described here.



Map 1— Showing the fossil referous localities in the area.

Monocotyledons

Family-Marantaceae

Genus - *Clinogyne* Salisb.

***Clinogyne lishensis* sp. nov.**

Pl.1, figs.1-3

This species is represented by two specimens, in which one is with part and counterpart.

Description - Leaves simple, symmetrical, narrow-lanceolate; preserved size 9.5 x 5 cm, 12.5 x 5.2 cm and 14 x 5.7 cm, apex broken; base broken seemingly obtuse; margin entire; texture chartaceous; petiole not preserved; venation eucamptodromous; primary vein prominent, almost straight, moderately thick at the base and thinning towards tip; secondary veins numerous, fine, arising very closely from the midrib and run almost parallel towards apex at greater length, angle of divergence narrow acute (20°-30°), unbranched; tertiary veins absent.

Discussion - The characteristic features of the fossil leaves such as lanceolate shape, entire margin, eucamptodromous venation and numerous, fine and very closely placed secondaries indicate that these leaves belong to the genus *Clinogyne* Salisb. of Marantaceae. The present fossil leaves have been compared with available three modern species, viz., *Clinogyne dichotoma* Salisb., *C. grandis* and *C. virgata* Benth. Of them, the leaves of *Clinogyne grandis* differ from the fossil in having comparatively distantly placed and prominent secondaries. Furthermore, in *C. virgata* Benth. the leaves are quite long and also differ in the

Plate 1

Clinogyne lishensis sp. nov.

1, 2. Fossil leaves in natural size showing shape, size and details of venation; Holotype Specimen no. BSIP 37408; Paratype no. BSIP 37409 and 37410.

course of secondaries. Thus the leaves of *C. dichotoma* Salisb. (F. R. I. Herbarium sheet No. 2866) of the family Marantaceae closely resemble the present fossil leaves.

The fossil leaves resembling the genus *Clinogyne* have earlier been described under the form species *C. ovatus* Awasthi & Prasad 1990 from the Siwalik sediments of Surai Khola area, Nepal. These leaves have been compared with the extant species *C. grandis* and therefore differ from the present fossils. *Clinogyne ovatus* Awasthi & Prasad 1990 possesses a symmetrical shape as compared to symmetrical shape of present fossils. Moreover, the angle of divergence of secondaries in the former is comparatively less.

Thus the present fossil is different from the already known species and has been described as *Clinogyne lishensis* sp. nov. The specific epithet has been established after Lish River, from where the fossil was collected.

Holotype - Specimen no. BSIP 37408.

Paratype - Specimen no. BSIP 37409 and 37410.

Locality - Lish River near Bagrakot, Darjeeling District, West Bengal.

Horizon - Middle Siwalik

Genus *Clinogyne* Salisb. consists of 20 species which are mostly distributed in tropical Africa (Willis, 1973). *C. dichotoma* Salisb. with which the fossil resembles, is a

shrub growing in the forests of eastern Bengal and Malaya Peninsula (Hooker, 1894). The occurrence of fossil leaves of *C. dichotoma* in this area further indicates the exchange of floral elements between the two subcontinents – India and Malaya Peninsula, and alongwith other already known species from this area confirm the prevalence of humid conditions during Siwalik sedimentation.

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