and the ketone formed has been qualitatively detected and quantitatively estimated according to the method due to Lappin[6]. The orders are one each in N-oxide and Ru(III). The order with respect to the substrate (S) is fractional at low concentrations (0.05 to 0.2 M) and zero at higher concentrations (0.5 M onwards). Spectral studies indicate that a 1:1 complex of Ru(III) and N-oxide is formed. EPR studies indicate that the oxidation state of Ru is not altered during the reaction. The mechanism given below

$$\mathrm{Ru(III)} + \text{N-oxide} \underset{k_{-1}}{\overset{k_1}{\rightleftharpoons}} \text{complex}$$

$$\text{complex} + \mathrm{S} \xrightarrow[\text{slow}]{k_2} \text{product} + \mathrm{Ru(III)}$$

leading to the rate expression

$$-\frac{d[\text{N-oxide}]}{dt} = \frac{k_1 k_2 [\mathrm{Ru(III)}][\text{N-oxide}][\mathrm{S}]}{k_{-1} + k_2[\mathrm{S}]} \quad (1)$$

accounts for the experimental results satisfactorily. Equation (1) can be rearranged as

$$\frac{1}{\text{Rate}} = \frac{(k_{-1}/k_2)}{k_1[\mathrm{Ru(III)}][\text{N-oxide}][\mathrm{S}]} + \frac{1}{k_1[\mathrm{Ru(III)}][\text{N-oxide}]}. \quad (2)$$

Using the data from experiments at low concentrations of the substrate, (2) has been verified (table 1).

The agreement between the values of k_1 in table 1 supports the mechanism. At high concentrations of substrate, $[\mathrm{S}] \gg k_{-1}/k_2$, a zero order in the substrate is observed. At low concentrations of substrate, k_{-1}/k_2 cannot be neglected in comparison with [S] and a fractional order in the substrate is observed.

Though the ligand, PPh_3, in the complex $RuCl_2(PPh_3)_3$, is oxidised to PPh_3O by the N-oxide, this complex is able to catalyse the oxidation reaction. In order to heterogenize this catalyst, experiments were carried out with $RuCl_2(PPh_3)_3$ anchored to polystyrene divinylbenzene polymer with 2% cross linking. DMF could not be used since it leaches out the ruthenium species. When benzene is used as solvent no leaching takes place, but since N-oxide is not soluble phenyliodosoacetate (PIA) is used as oxidant. The anchored ruthenium on phosphinated polymer, prepared by the method of Allum *et al*[7] contains about 1.13% of ruthenium as estimated by thiourea method[8]. Though the percentage of the product formed in the case of the anchored catalyst (12.5% conversion in 15 min) is about six times less than that of the homogeneous catalyst (80% conversion in 15 min), the anchored catalyst can be regenerated and the regenerated catalyst is found to be as effective as the original one. Only very low concentrations of PIA are used (< 0.001 M) in the case of anchored catalyst, since excess of PIA leads to leaching.

Table 1 *Evaluation of rate constants from double reciprocal plots at low concentrations of substrate* ([S] < 0.2 M)

	k_1 in $M^{-1} min^{-1}$		
Substrate	From pseudo first order plots	From double reciprocal plots	(k_{-1}/k_2)
Cyclohexanol	36.56 ± 0.81	35.72	0.044
1-Phenylethanol	39.11 ± 0.47	38.80	0.041
2-Propanol	34.29 ± 0.49	34.50	0.050

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MID-HOLOCENE FOSSIL WOOD FROM BHIMA BASIN IN SOLAPUR DISTRICT, MAHARASHTRA.

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MORE than ten carbon-14 dates for Pre-Early Holocene and two for Mid-Holocene alluvial phases have been reported[1]. Alluvial deposits of semi-arid region of eastern most part of western upland of Maharashtra have not been dated so far due to non-availability of datable material. Hence a discovery of fossil wood from alluvial deposits of Sina river, a tributary of Bhima river, seems to be of geomorphic importance.

Figure 1 shows the geological section across the Sina river near village Pakani (N 17°51′–75°10′) in the Solapur district of Maharashtra. Flows of Deccan Trap Basalt of Cretaceous-Eocene age are exposed on left bank while they are covered with thick alluvial deposits on the right bank of the Sina river. Carbonised fossil wood has been encountered 9 m below the present river bed during excavation of the foundation of K.T.Weir. The fossil wood was sent to the Birbal Sahni Institute for carbon-14 dating. The Institute furnished the age of fossil wood as 4260 ± 110 years B.P. (BS-458) which indicates that the semiconsolidated conglomeratic bed occurring in the vicinity is of nearly the same age. This date confirms the general observations that most of the rivers in Western Maharashtra flow below the present river bed during Early and Mid Holocene times. Geological setting and depth at which the fossil wood was discovered indicate that the local depression or fall might have formed due to the erodeble characteristic of rock occurring in the vicinity.

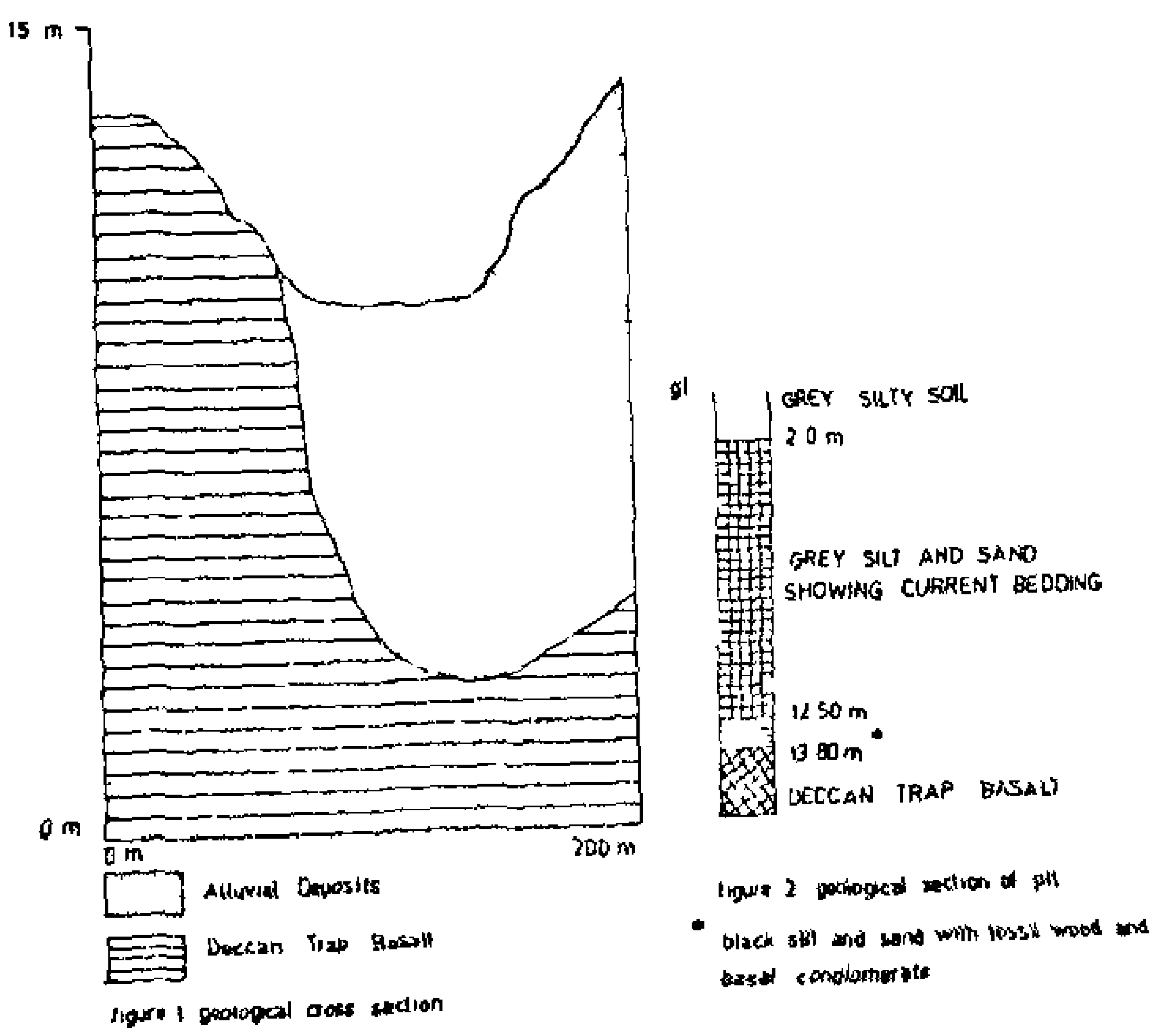

Figure 1. Geological cross section and geological section of pit.

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DOES EYESTALK ABLATION INDUCE HYPERPHAGIA?

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NON-AVAILABILITY of adequate number of spawners of penaeid prawns triggered most of the researchers to concentrate their work on the reproduction of these prawns in captivity[1]. Efforts have been made during the past 10 years to induce prawns, which normally mature and spawn only in the sea, to attain maturity under captive conditions[2]. Carideans differ from penaeids by the ease with which they mature, mate, spawn and incubate their eggs in captivity. Eyestalk ablation confines these events within a shorter inter-molt period. Though the molt and growth-enhancing effects of eyestalk ablation have been studied by many authors[3–5] in various decapod crustaceans, studies on the effects of food consumption by natantians are lacking. In diecdysic prawns molting and reproduction are synchronizing events and hence they have to apportion the available energy simultaneously for reproduction and molting[6]. This is true of adult *Macrobrachium nobilii*. Juveniles of *M. nobilii*, on the other hand, spare no energy on reproduction. Therefore it was decided to perform eyestalk ablation on juveniles so that its effect on somatic growth could be traced out.

Juveniles of *M. nobilii* (0.25 ± 0.05 g; 28 ± 2 mm length) collected from the Cauvery waters, Tiruchirapalli were acclimated to laboratory conditions. A control (non-ablated) and an unilateral eyestalk (left) ablated groups were studied for four successive months. Food consumption, growth (joule/g animal) and growth efficiency (%) were quantified and the data were statistically analysed.

Table 1 reveals that ablated *M. nobilii* significantly ($t = 5.65$; $P < 0.0005$) consumed more food (1.1 times) than that of the control. Growth was also increased by 1.6 times and the growth efficiency 1.5 times in the destalked group. All these increases were statistically significant (student's t test—growth, $t = 13.0$, growth efficiency $t = 10.6$; $P < 0.0005$).