Figure 2a–f. a. *Scapula* (shoulder plate): (GC/S/2327), Concave at the inner margin. Length 1.25 m, width 0.35–0.40 m, wedge-shaped; coracoid foramen at the lower left corner; **b.** *Femur*: (GC/S/2328), Length 80 cm, width 11 cm in the middle part; **c.** *Rib bones*: (GC/S/2329), Cervical rib bone near the diagonal scale. The rib is broader at the base and tapering at the end; **d.** *Dorsal vertebra*: (GC/S/2829), Opisthocoelous type dorsal vertebra with a convex anterior end and concave posterior end. Length 25 cm, diameter 15 cm; **e.** (1) Claw with sharp pointed apical end. Wrinkled in the centre (GC/S/2331). (2–4) Digits of the manus (GC/S/2331); **f.** (A) Cross section of the sauropod tooth to the left side of A, (B) Ossified skin showing nodous appearence (GC/S/2332), (C) Coprolite: Intestinal groove near C. (GC/S/2333).

also contains similar invertebrate assemblage. Based on this, it is possible that the age of the dinosaurian fossils near Anjar may extend up to lowermost Palaeocene.

The discovery of possible saurischian remains from intertrappeans of Kachchh has opened a new potential horizon for further search of dinosaurs from late Upper Cretaceous and possible lowermost basal Tertiary beds in Gujarat and other parts.

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BIOACCUMULATION OF ZINC BY *PENICILLIUM* SP.

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Microbes tolerating heavy metals and capable of sequestering them from environmental media have been reported in nature[1–3]. Thus *Micrococcus luteus* and *Azotobacter* sp. have been shown to remove lead from growth media[4]. This report deals with the isolation of a *Penicillium* sp. from soil with a significant bioabsorption capacity for zinc and potentially useful in removing zinc from waste water.

Five grams of sewage sludge-treated soil were added to a 250 ml capacity Erlenmeyer flask containing 50 ml of nutrient broth + 1000 ppm zinc as $ZnSo_4 \cdot 7H_2O$ (pH 5) to isolate the culture for zinc removal. The flask was incubated at room temperature for 7 days. The suspension was streaked on nutrient agar plates (nutrient medium, pH 5) and incubated at 30°C for 5 days.

The colonies appearing on the nutrient agar plates were mostly of fungus. A dominant type of colony of fungus (tentatively identified as *Penicillium* sp.) was inoculated into aliquots of 100 ml of nutrient broth (pH 5) supplemented with increasing concentration of zinc and incubated at room temperature for 7 days.

Table 1 *Bioaccumulation of Zn by Penicillium sp.*

Concentration of zinc in the medium (mg l)	Dry weight biomass (mg)	Accumulation of zinc in biomass mg/Zn/1000 mg biomass
0	160	0.125
100	150	65.33
200	143	137.76
300	139	201.43
400	135	223.70
500	130	235.38
600	129	241.86
700	125	252.00
800	123	256.09
900	123	256.09
1000	123	256.09

Fungal cells were harvested from growth medium by sieving through cheese cloth and then washing twice with physiological saline. The collected biomass was digested in a 5:1 nitric/perchloric acid mixture and analysed for zinc using an Atomic Absorption spectrophotometer (Elmer).

The effect of zinc on the cell growth in terms of biomass at different concentrations is reported in table 1. It can be seen that high concentrations of zinc inhibited growth up to 23% of control values.

Table 2 *Concentrations of zinc in process waste waters*

Industrial process	Zinc concentration (mg/l) range
Metal processing	
Bright dip wastes	0.2–37
Bright mill wastes	40–1,463
Brass mill wastes	8–10
Pickle bath	0 5–37
Wise mill, pickle	36–374
Plating	
General	2.4–120
Zinc	70–150
Brass	11–55
Silver plating	
Silver plating wastes	0–25
Acid waste	5–220
Alkaline	0.5–5.1
Rayon wastes	
General	250–1000
Other	
Vulcanized fibre	100–300

Zinc at a concentration of 50 ppm has been reported to be toxic to microorganisms[5]. *Penicillium* sp. accumulates zinc in a concentration-dependent manner up to 600 ppm in the medium. Accumulation of zinc by *Penicillium* sp. exceeding the amount which binds to the cell wall is presumably due to an energy-coupled transport system which may involve a Zn binding protein with properties similar to metallothionein.

The isolate of *Penicillium* sp. may be useful in studies designed to elucidate the mechanisms of metal microbe interactions, and to remove and recover zinc from waste waters. It has been noticed[6] that industrial waste waters have been reported to contain zinc at various concentrations (table 2). Microbial systems like the one isolated in the present study may be capable of abstracting substantial quantities of zinc from waste waters.

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COTYLEDONARY NODE CULTURE AND MULTIPLE SHOOT FORMATION IN PEANUT: EVIDENCES FOR SOMATIC EMBRYOGENESIS

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TISSUE culture techniques are currently used extensively for genetic upgradation of crop plants in view of the possibility of the origin of aberrant/desirable types through multiple shoots via callus[1]. But legumes, in general, hardly produce plantlet from the cultured tissues. Several explants have been tested for plantlet regeneration of which the