structures such as small-scale cross laminations, wave ripples and the presence of intrabasinal pellets corroborate intertidal environment[2,4]. The red pigmentation is due to the presence of haematite. Kharakwal and Bagati[12] postulated a penecontemporaneous diagenetic process involving *in situ* alteration of drab iron into haematite giving red coloration of the sediments.

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BOLETUS EDULIS BULL. EX FR.—AN EDIBLE MUSHROOM NEW TO INDIA

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Boletus edulis Bull. ex Fr. an edible bolete, is regarded a prized delicacy in the West and is consumed in Himachal as well, but to a lesser extent. Pickled specimens stay longer and are relished the most. The species, though quite common, has not been described from India so far[1-4]. The specimens have been deposited in the Herbarium, Department of Biosciences, H.P. University, Shimla (HPUB).

Boletus edulis Bull. ex Fr. Syst. Myc. **1**: 392. 1821. Figure 1.

Pileus 2–12 cm broad, broadly convex in age; surface dry, viscid when wet, glabrous, smooth, wrinkled to shallowly pitted; light yellowish brown to brownish or with darker shades of brown[2], dusted with a whitish bloom; margin regular, smooth, incurved when young; context firm, 10–15 mm thick, white, unchanging, smell pleasant, taste mealy; tubes 8–10 mm deep, adnexed but depressed around the stipe, pale whitish, yellowish white to olive yellow in age, unchanging; pores minute,

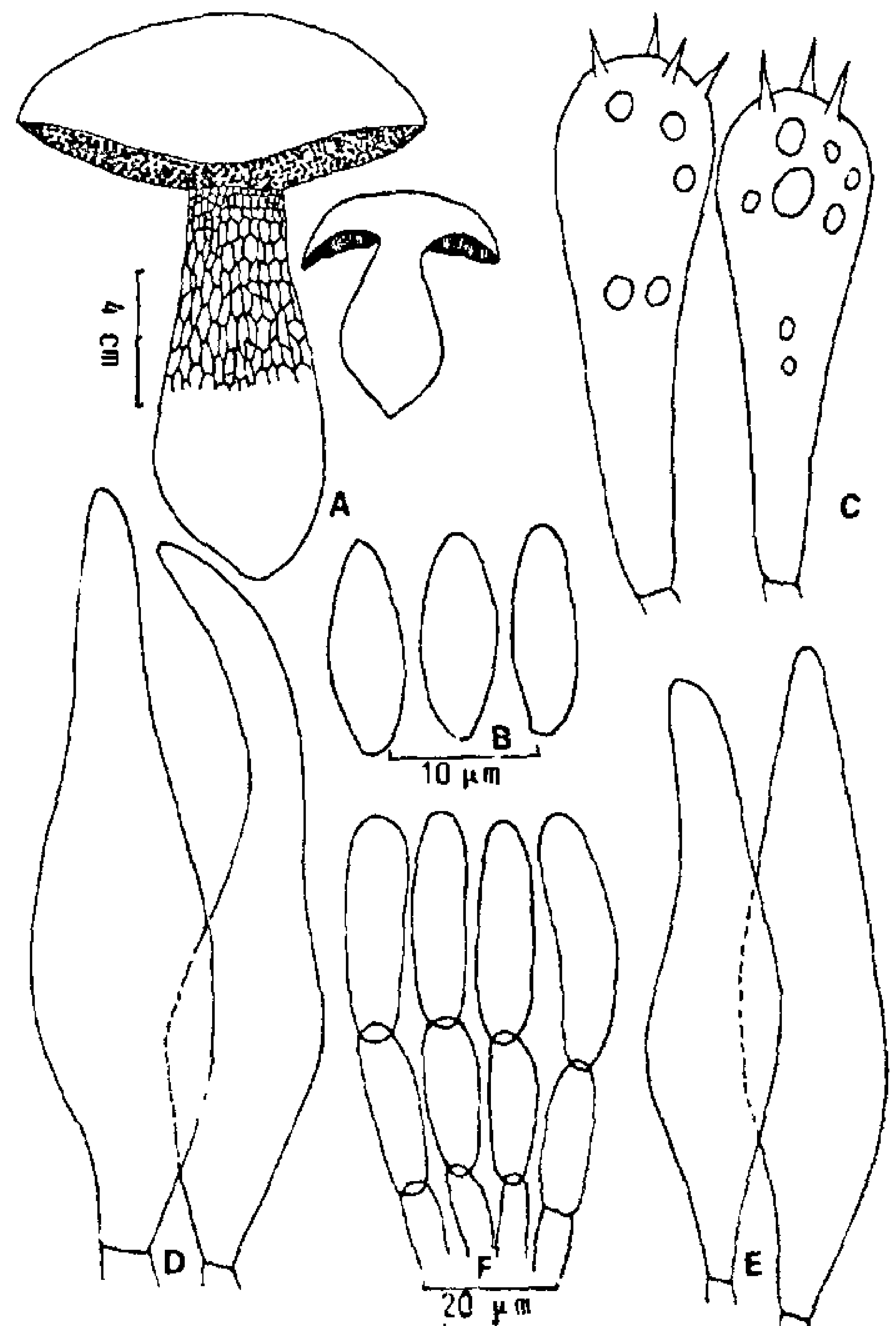

Figure 1A–F. *Boletus edulis* Bull. ex Fr. **A.** Basidiocarp and longitudinal section; **B.** Basidiospores; **C.** Basidia; **D.** Pleurocystidia; **E.** Cheilocystidia, and **F.** Pileus surface.

roundish, stuffed in young, yellowish to yellowish brown in age, unchanging; stipe central, 4–9 cm long, 1–2 cm across, bulbous when young becoming equal, base subradicating, light brownish in the apex, whitish yellow below, reticulate in the upper half; flesh firm, white, unchanging.

Spores olive brown in mass, 12–16(17) × 4–5.5 μm, ellipsoid, subfusiform, inequilateral in profile, yellowish to olive yellow in KOH, inamyloid, smooth, hilum distinct; basidia (27)30–40(45) × 9–12 μm, clavate, 4 spored; pleurocystidia scattered 40–55(65) × 7–15 μm, narrowly fusoid ventricose, thin-walled; cheilocystidia similar.

Tube trama divergent; pileus cutis a palisade-like trichodermium of hyphae, collapsing at maturity 8–12 μm wide, hyaline to pale in KOH, yellowish in Melzer's; stipe cutis of loosely interwoven hyphae, 4.5–8 μm wide, with a disrupted caulohymenium; caulocystidia 25–55(60) × 9–18 μm, clavate to ventricose, thin-walled; clamp connections absent. Chemical spot tests: KOH: Flesh-pinkish white, cuticle-reddish brown; NH_4OH: Flesh-pinkish white, cuticle-light brown; $FeSO_4$: Flesh-negative to greyish, cuticle-negative, Melzer's-Flesh and cuticle-negative.

Habit and habitat: Scattered to gregarious under *Cedrus deodara* Hook. and *Pinus wallichiana* Jack., mycorrhizal with the former.

Material examined: Acc. Nos: Shimla; HPUB 265, 1699, 1758, 1768, 1770, 2007, 3091; Kullu; HPUB 3160, 3161, 3162, 3239; Chamba; 3328.

Comments: *B. edulis* has never been recorded under/with *C. deodara* and *P. wallichiana*[4]. This is, therefore, first report of its occurrence outside the earlier recorded range.

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PATTERN OF ACID PHOSPHATASE ACTIVITY DURING SHOOT ORGANOGENESIS IN NORMAL AND VARIANT CALLUS CULTURES OF *NICOTIANA TABACUM* L.cv. WHITE BURLEY

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ENZYME studies in tissue cultures under different culturing conditions leading to different end results can be a useful index in understanding the cellular or subcellular events[1–3]. Phosphatases form a group of important enzymes involved in different cellular functions. These are also important for their role in the mobilization of food reserves[4,5]. Acid phosphatases were studied under non-shoot-forming (NSF) and shoot-forming (SF) conditions in normal and variant callus cultures of *Nicotiana tabacum* L.cv. White Burley to determine whether different callus cultures follow the same pattern during shoot formation. A slow-growing stable variant with different leaf morphology, internode length and flowering pattern appeared spontaneously during regeneration of normal callus cultures. The morphological features were maintained during successive cultures. Normal callus and callus developed from this variant were used as materials.

Callus cultures were established from leaf midrib explants on LS medium[6] supplemented with 3 mg/l napthalene acetic acid and 1 mg/l benzyladenine in the dark at 25 ± 2°C. Callus was subcultured and maintained in the same medium. For shoot regeneration, small pieces of calli (approximately 100 mg fresh weight) were transferred to LS medium fortified with 2 mg/l indole acetic acid, 2 mg/l kinetin, 160 mg/l adenine sulphate and 340 mg/l sodium dihydrogen orthophosphate and were kept at 25 ± 2°C under diffused light. Shoots appeared on the 10th and 12th days of transfer, in normal and variant callus cultures respectively. Acid phosphatase activity was assayed every alternate day from the day of transfer to callusing/shoot forming medium using the Jones[7] method.

Acid phosphatase activity under NSF and SF conditions in normal and variant callus is shown in figure 1. The specific activity increased considerably under NSF conditions in normal callus. However in variant callus cultures, the acitivity was low. Activities were quite comparable under SF conditions. The peak activity appeared two days prior to shoot