

First Report of Late Jurassic *Aulacosphinctes* from the volcano-sedimentary sequence of Dras Formation, ITSZ, Ladakh Himalaya, India

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The Dras volcano-sedimentary sequence has provided an avenue for the preservation of both marine sediments and biota within the Indus–Tsangpo Suture Zone (ITSZ). Lithologically, the Dras Formation consists of pillow lavas, doleritic sills, irregular basaltic to andesitic and dacitic flows intercalated with pyroclastics, volcanoclastic sediments, radiolarian chert, siltstone, mudstone, shale, conglomerate and sporadic lenses of limestone. The evolution and assigning absolute stratigraphic age to the Dras arc is still debatable. The radiolarian cherts from Dras Formation indicate Upper Callovian to Tithonian age (Honegger et al., 1982 and Dietrich et al., 1983). However, the radiometric age of the Dras volcanics displays that the oceanic Dras arc was formed within Neo-Tethys in the Mid-Late Cretaceous (Reuber 1984; Reuber et al., 1989; Robertson and Degnan 1994). The sporadic limestone associated with the Dras Volcanics yields *Orbitolina* which confirmed Albian-Cenomanian age (Fuchs 1979, Reuber 1984, Reuber et al., 1989). The pioneer workers of GSI like Srikantia and Razdan (1980) assigned Upper Cretaceous to Palaeocene age to Dras Formation based on the structural disposition of the lithounits.

During field season 2018-19 (Khalsi-Leh Expedition, 2018), a typical Late Jurassic ammonite (Specimen no. KCM01) has been discovered from Khalsi area which has been identified as *Aulacosphinctes*. The discovery of Late Jurassic *Aulacosphinctes* from the Dras Formation also supplements to the Upper Callovian to Tithonian age given by Honegger et al., (1982) and Dietrich et al., (1983). Though, the debate on the deep marine facies association of the radiolarian and the shallow marine association of ammonite (*Aulacosphinctes*) is wide open. It is widely believed, that the radiolarian chert not being the part of Dras Formation owing to its genetic association, is more likely a part of the obducted oceanic crust instead. As the area is highly tectonized, there was a possibility, that the specimen might have been deposited within the Khalsi Formation. But the Aptian-Albian age of the Khalsi Formation is well established on the basis of *Orbitolina*. Hence, the discovery and identification of this ammonite (*Aulacosphinctes*) is an aide to demarcate the stratigraphic boundary between the Dras Formation and the Khalsi Formation apart from lithological mapping. As the evolution of Dras arc started from Mid-late Jurassic, the specimen must have got preserved within the volcano-sedimentary sequence of Dras Formation. Hence, the episodic volcanism along with

penecontemporaneous sedimentation dates the Dras Formation from Late Jurassic-Tertiary contradicting the earlier conceived age i.e from Cretaceous to Tertiary. This discovery will help to reconstruct the palaeoecology, palaeoenvironment and correlate the palaeogeographic distribution of the *Aulacosphinctes*.



Fig. 1a -: Well preserved mold of late-Jurassic *Aulacosphinctes* (specimen no. KCM01), Dras Formation. Scale bar 1cm.



Fig. 1b -: Cast (restored at Lab) of *Aulacosphinctes* (specimen no. KCM01) shows bifurcation of the primary ribs above the mid-lateral height. Scale bar 1cm.

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