

## Jurassic ammonites from Chharap valley, Himachal Pradesh, India

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### Abstract

The present paper describes two species of ammonites (*Scarburgiceras* cf. *scarburgense* and *S. praecordatum*) from the Laptal Formation exposed in the Chharap valley of Himachal Pradesh. The ammonites are suggestive of Lower Oxfordian age for the upper units of the Laptal Formation.

### Introduction

The Mesozoic succession is fairly well developed in the Chharap valley which lies in the northeastern corner of Himachal Pradesh within the coordinates 32°32' to 33°00'N : 77°35' to 78°00'E. During the palaeontological and stratigraphical in-



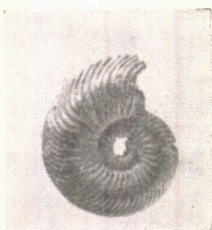
1a



1b



1c



2a



2b



2c

Figure 1. *Scarburgiceras* cf. *scarburgense* XI  
a) lateral view  
b) ventral view  
c) apertural view

Figure 2. *Scarburgiceras praecordatum intermedia* XI  
a) lateral view  
b) ventral view  
c) apertural view

vestigations in parts of Sarchu and Chharap valleys of Ladakh and Himachal Pradesh, the author made fossil collections from different stratigraphic horizons. An outline of the geology of this region along with geological map has been published by Raina and Bhattacharya (1977).

The ammonites (*Scarburgiceras* cf. *scarburgense* and *S. praecordatum*) des-

cribed in the present paper have been collected from the marly horizon (horizon 3 of Raina and Bhattacharya, 1977) exposed along the eastern bank of the Chharap nala in the Chharap valley. The ammonite bearing horizon has also yielded well preserved specimens of echinoids and lamellibranchs. This horizon constitutes the lower part of the Laptal Formation which lies conformably above the Megalodon Limestone and is overlain by the Spiti Shales. The Laptal Formation in the Chharap valley is represented by 80 metres thick succession and is well developed along the eastern bank of the Chharap nala, from Pangpo area in the south up to Thingling nala in the north. The following stratigraphic succession for the Laptal Formation in the Pangpo section has been worked out by Raina and Bhattacharya (1977):

- |   |         |
|---|---------|
| 5. Ferruginous sandstones rich in lamellibranchs and <i>Belemnites</i> .  | 1.5 m.  |
| 4. Grey thin platy limestone and calc arenite bands with brachiopods ( <i>Rhynchonella</i> , etc.) and lamellibranchs ( <i>Ostrea</i> and <i>Pecten</i> ) | 20.0 m. |
| 3. Marly bands with <i>Arca</i> , <i>Pecten</i> , <i>Trigonia</i> , <i>Ostrea</i> , <i>Cidaris</i> and ammonites described in the present paper           | 5.0 m.  |
| 2. Buff shales at times containing <i>Belemnites</i> .  | 5.0 m.  |
| 1. Greyish platy limestone with thin intraformational conglomerate bands.   | 4.5 m.  |

The Laptal Formation of the Chharap valley is generally correlated with the Laptal Series of northeastern Kumaun as worked out by Heim and Gansser (1939) and both these are considered to be of Callovian age. The presence of well preserved specimens of *Scarburgiceras* cf. *scarburgense* and *S. praecordatum* are suggestive of the fact that the upper limits of the Laptal Formation may extend into Lower Oxfordian and the entire formation may range in age from Callovian to Lower Oxfordian.

### Systematic description

The specimens under description belong to the genus *Scarburgiceras* which has been considered also as a subgenus of *Cardioceras*. It contains besides a lot of forms with true early cardioceratoid habitus, also species in the state of transformation from *Quenstedtoceras* to *Cardioceras*. The specimens described here belong to the latter group, having still a certain look of *Quenstedtoceras*. Due to this phylogenetic development of these forms they are considered as characterizing the transition beds between the *Quenstedtoceras* and *Cardioceras* subzones, probably indicating the lowermost horizon of the marine zone.

*Scarburgiceras* cf. *scarburgense* (Young & Bird)

(Fig. 1 a-c)

1939 *Cardioceras scarburgense* (Young & Bird)—W. J. Arkell, Woodham, p. 165, pl. 10, fig. 1.

The specimen from the Chharap valley has the following dimensions:

DM 25.2 mm WH 10.2 (0.40) mm Wb 7.0 (0.28) mm Uw 6.9 (0.27) mm  
Number of ribs/half whorl: I 15 E 25

The specimen under description is identical to the holotype described by Arkell (1939) with the difference that the keel in the Himalayan specimen has not been so strongly developed, thus suggesting presumably a little earlier variation than the holotype.

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*Scarburgiceras praecordatum* (R Douvillé) *intermedia* Maire  
(Fig. 2a-c)

1938 *Cardioceras* (Anacard.) *praecordatum* H. Douv. var. *intermedia* nov. —  
V. Maire *Cardioc.*, p. 58. pl. 6, fig. 6.

The specimen from the Chharap valley has the following dimensions :

DM 21.0 mm WH 8.8 (0.42) mm Wb 5.8 (0.28) mm Uw 7.9 (0.38) mm  
Number of ribs/half whorl: I 19 E 30

The specimen under description can be included in the species *praecordatum*, which is a species of extreme high variability. with the exception of rather large umbilicus best possibility of comparison is given with Maire's subspecies '*intermedia*'. Other specimens figured by Maire as '*praecordatum*' (pl. 7, figs. 3, 6) are well comparable but have a more distinct keel. Also a specimen figured by Spath (1939, pl. 7, fig. 1) as '*praecordatum praemartini*' belongs to this group; development of the keel is still intermediate between the form here described and those of Maire's true *praecordatum*.

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