SMITHIAN (EARLY TRIASSIC) AMMONOID SUCCESIONS OF THE TETHYS:
NEW PRELIMINARY RESULTS FROM TIBET, INDIA, PAKISTAN AND OMAN

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Following the end-Permian mass extinction, ammonoids were among the fastest clades to recover (Brayard et al., 2006), with at least two diversification phases during the Early Triassic. Diversification first peaked during the Smithian and was followed by a marked extinction phase at the end of this (sub-)stage. It was then followed by a second and massive evolutionary radiation during the Spathian. The well-documented, ammonoid-rich Smithian succession of NW Guangxi, South China is subdivided into three main faunas, i.e., the “Flemingites rursiradiatus beds”, the “Owenites koeneni beds” and the “Anasibirites multiformis beds,” in ascending order (Brayard and Bucher, subm.). Ongoing work on other Smithian Tethyan sections such as Tulong (Tibet), Spiti (India), Salt Range (Pakistan), and Oman (exotic blocks at Baid, Wadi Musjah and Jabal Safra) shows that these subdivisions have Tethyan-wide correlates. Moreover, even finer subdivisions can be correlated throughout the studied basins (Fig. 1).

The beginning of the Smithian is characterized by beds with Rohillites, which occur in Guangxi, Spiti (Krystyn et al., 2007), the Salt Range and Oman. The subsequent “Flemingites beds” occur in Guangxi, Spiti, the Salt Range, and Oman and contain a highly diversified ammonoid fauna. In the Tulong section, ammonoids are not preserved in this interval, but this time interval is nevertheless represented by diagnostic conodont assemblages. The next overlying “new prionitid A” beds were found in Tulong and in the Salt Range. Associated with this new genus are Aspenites acutus and Juvenites. Their exact correlation with the NW Guangxi succession remains open.

The genus Owenites of middle Smithian age is relatively long-ranging and occurs in all studied localities except for the Salt Range. In NW Guangxi, the “Owenites beds” are further subdivided into the Usurria, Hanielites/Proharpoceras and the Inyoites/Pseudoceltites horizons (Brayard and Bucher, subm.). These smaller subdivisions are partly found in the other studied sections. The lower part of the Owenites beds in Tulong, Spiti, the Salt Range and in Oman is represented by beds containing a new genus, provisionally called “new prionitid B,” as well as Parannites spathi and Owenites simplex. These beds are more or less correlative to the Usurria and Hanielites/Proharpoceras horizons from NW Guangxi. Proharpoceras was also found in an exotic block from Oman of presumably the same age (Brayard et al., in press). The next beds in the Salt Range and in Tulong are characterized by the occurrence of “Flemingitidae,” which may possibly represent a new genus among Flemingitidae. Exact correlation of this fauna with the NW Guangxi succession remains open. The upper part of the “Owenites beds” is characterized by the association of Inyoites, Pseudoceltites, Stephanites and/or Meekoceras and is present at all studied localities.

The subsequent “Anasibirites/Wasatchites beds” also occur in all localities. However, in Tulong, only poorly preserved prionitids here referred to as ?Wasatchites were obtained. Therefore, the occurrence of this fauna in South Tibet still needs to be confirmed. The “Anasibirites/Wasatchites beds” mark the onset of the end-Smithian ammonoid extinction and are characterized by reduced diversity and a high degree of cosmopolitanism. The next overlying beds with Glyptophiceras sinnatus (Waagen) occur in the Salt Range, Kashmir and Spiti (G. aequicostatus (Diener) is here treated as a synonym of G. sinnatus) and probably also at Tulong, where they contain a new species of Hedenstroemia, called here “Hedenstroemia A.” The uppermost Smithian beds contain “Hedenstroemia A” and various representatives of Xenoceltites. These beds were recognized in NW Guangxi, Tulong, Spiti and in the Salt Range. They correspond to the extinction peak at the very end of the Smithian.

FIGURE 1. Correlation of Smithian Tethyan ammonoid successions.
REFERENCES

Brayard, A. and Bucher, H., subm., Smithian (Early Triassic) ammonoid faunas from northwestern Guangxi (South China): taxonomy and biochronology: Fossils and Strata.