Palaeobiogeographical distribution of the Early Jurassic *Lithiotis*-type bivalves *versus* Lhasa Block history

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The supercontinent Pangea was formed during the Carboniferous time as the result of the Hercynian orogeny. However, separation of the Cimmerian Continent [Iran (Alborz)-Qiangtang-Malaysia-Sibumasu] from the Gondwanan part of Pangea during the latest Carboniferous–earliest Permian times by rifting and drifting event originated Neothethyan Ocean (Golonka et al., 2006). Northwards migration of this continent took place during Permian-Triassic times causing wide opening of the Neotethys and closing of the Paleotethys Ocean. During the latest Permian and earliest Triassic quick rifting of this ocean and drifting of several Gondwana-derived blocks caused strong Indosinian orogeny during Late Triassic times. This orogeny was the result of collision of Indochina with both Sibumasu and South China blocks, which closed part of the Paleotethys Ocean. The time of new break-up of northernmost part of the Gondwanan Pangea is still enigmatic but most probably took place during earliest Jurassic times. An especially relationship between Qiangtang and Lhasa blocks in space and time causes a lot of controversies. By this reason palaeogeographical position of the Lhasa Block during Mesozoic times is still matter of discussion. Its Late Paleozoic (Carboniferous-Permian) and Triassic south Pangean (peri-Gondwanan) affinities on the southern margin of the Paleotethys are indicated both by paleomagnetic and facies studies. After this break-up the Lhasa Block very quickly drifted northward from Gondwana.

From the palaeobiogeographical point of view the world-wide distribution of Pliensbachian-Early Toarcian large bivalves of the so-called *Lithiotis*-facies (*sensu* Fraser et al., 2004 with literature cited therein), dominated by *Lithiotis*, *Cochlearites*, *Litioperna* genus, indicates very rapid expansion of such type of bivalves, and could be good evidence of palaeogeographical position of the Lhasa Block in this time. The huge, up to 40-50 cm long, these bivalves are most significant representatives of buildup-maker of shallow marine/lagoonal bivalve mounds (reefs) in numerous places of Tethyan-Panthalassa margins during Pliensbachian-Early Toarcian times. The distribution of *Lithiotis*-facies bivalves from Western (Spain, Italy) and Middle Europe (Slovenia, Croatia, Albania and Romania) trough north Africa (Morocco) and westernmost Asia/Arabia (eastern Turkey, Iran, Iraq, Kuwait, Oman, Arabian Emirates) up to central Asia – Timor Island, Himalaya Mts (Nepal, China) and western margin of both Americas (USA, Peru) indicates world-wide, rapid expansion of such *Lithiotis*-type bivalves (Leinfelder et al., 2002; Fraser et al., 2004; Krobicki and Golonka, 2009). Especially, the Himalayan (Nepal – Garzanti & Frette, 1991) and Tibetan (Nyalam area – Yin et al., 1998, 1999; Yin & Enay, 2004; Yin & Wan, 1998; Shi et al., 2006; see also – Jadoul et al., 1998) occurrences of *Lithiotis* and/or *Cochlearites* bivalves could help to reconstruct of Early Jurassic position of the Lhasa Block. These occurrences may suggest migration path from western Tethys trough Panthalassa Ocean up to western margin of North and South America (USA, Peru). The Early Jurassic migration routes were connected both with break-up of Pangea and oceanic circulation, which facilitated high speed of distribution of larva's of such oyster-like bivalves. Previously in Triassic time the migration of sea fauna (Late Triassic crinoids, mollusks, crustaceans and so on) was going through the vast eastern Tethys branch of the Panthalassa Ocean which is perfectly visible in the distribution of the typical Alpine fauna of the western Tethys found in the numerous terranes along the western coasts of South and North America. The fauna did not have a possibility to migrate westward, but it could use the numerous terranes within Panthalassa as s*tepping-stones* allowing relatively free migration eastward from the Alpine Tethys (Kristan-Tollmann and Tollmann, 1985). Similarly, *Lithiotis*-type bivalves during larval-stage episodes could use the numerous terranes within Panthalassa Ocean as „*stepping-stones*" allowing free migration eastward from the Alpine Tethyan Ocean to Himalayan/Tibetan one.

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On the other hand, the separation of Laurusia and Gondwana, which was initiated by the Triassic break-up of Pangea, continued during Early-Middle Jurassic time. The Early Triassic continental rifting was magnified at the Triassic/Jurassic boundary and the Atlantic Ocean originated as a consequence of this break-up. In effect, the origin of the narrow sea strait, so-called *Hispanic Corridor* took place between these two continents and connection of the Panthalassa Ocean (Proto-Pacific) and western (Alpine) Tethys gradually started in Early Jurassic, most probably in Sinemurian-Pliensbachian times. Therefore the widespread distribution of numerous fossil invertebrate groups took place during these times (Hallam, 1983; Damborenea, 2000; Arias, 2006, 2007, 2008; see also Damborenea & Mancenido, 1979; Boomer & Ballent, 1996; Venturi et al., 2006; Krobicki & Golonka, 2009). It is still open question, which migration route has been used by *Lithiotis*-facies bivalves to their whole world dispersion – trough Hispanic Corridor or by Panthalassa Ocean?

Recovery of marine fauna after Triassic/Jurassic mass extinction event was mainly marked by *Lithiotis*-type bivalves buildups distribution (e.g. Leinfelder et al., 2002; Fraser et al., 2004; Krobicki & Golonka, 2009). Their world-wide distribution indicate both very rapid occupation of specific ecological niches (mainly shallow-marine/lagoon-type carbonate sedimentation) and palaeogeographic/geodynamic regimes during break-up of Pangea in Pliensbachian-Early Toarcian times (Krobicki & Golonka, 2009). The key to understand of migration pattern of these bivalves is connection with geodynamic reconstruction, mainly including Asian palaeogeography.

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