Discovery and Implications of the Qiangtang Indosinian Accretionary Complex Belt in Central Tibet, China

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The study area is located in the hinterland of the Qiangtang basin in the Tibetan plateau and situated between the Gondwana and Eurasian plates, whose north boundary is the Longmucuo-Shuanghu-Lancangjiang tectonic belt and south boundary is the Bangonghu-Nujiang tectonic belt (Figure 1). From northwest to southeast there exists a series of metamorphic complexes between the above two tectonic belts, including Gemuri, Nierong, Jiayuqiao, Jitang, Yunling, Ximeng-Mengtong, Changning-Menglian,and Jinghong, which were assembled during formation and linked together as an integrated tectonic zone. These metamorphic complexes are usually covered by Mesozoic strata and denudated by later intense extension, which caused ductile shear and transposition deformation. Detailed research on the Qiangtang accretionary complex is significant to understand the tectonic attributes of the complex aggregation, analyze the tectonic framework of the Qiangtang area, and study the evolution of Paleotethys.

The central Qiangtang area is mainly covered by Mesozoic and Cenozoic strata, complicating research on the metamorphic complexes that occurring across a very wide area. Although the study of these complexes relates to our understand of the evolution of the Qiangtang basin and even of the Tibetan plateau, there exist different views on their age, origin and tectonic attributes (Kapp and others, 2000; 2003). Based on our field work and data, it is found that the flysch and basalt-schist suites developed in the complexes experienced strong structural transposition. The complexes also include early-to-late Paleozoic marbles with rootless folds, blueschists in closed-isoclinal folds together with marbles, and blocks of eclogite in outcrop. Generally, they all occur as tectonic slices that experienced regional intense structural transposition and superimposition, and now exhibit a regular penetrative foliation. The original rocks interpreted from the metamorphic rocks include clastic rock, mudstone, siliceous rock, carbonatite, pillow basalt and gabbro. On the basis of the above characteristics, it is presumed that the central Qiangtang metamorphic complex should be classified as an accretionary complex. The construction of its lithology is described as follows:

1/ Terrigenous moderate- to deep-water flysch: the major rocks are silty slate, sericite-phyllite, and sericite quartz-schists, intercalated with yellowish gray medium-thick bedded quartzite, pebbly quartzite, muscovite quartzite, metamorphosed quartz sandstone, as well as occasionally intercalated with massive limestone, marble, greenish-gray epidote actinolite schists, phyllite, tuffaceous metamorphic siltstone, silty slate, and ophiolite blocks, etc. These rocks exhibit intense deformation, including tight folds, netted quartz vein and plenty of rootless folds.

2/ Seamount (ocean-island) blocks: these include massive basalt, limestone (formed in shallow water), and basaltic or limy conglomerate. In a few outcrops, the basalt and limestone are in direct contact. But in most cases, the basalt, limestone, and conglomerate blocks are dispersed through and incorporated in the flysch. Pillow structure is developed in the basalt, and sometimes basaltic columnar-joint structure is also observed as evidence of basalts erupting over the sea surface.

3/ Ocean-floor sedimentary rocks: they mainly include siliceous rock, argillite, so metimes including glacial-erratic blocks. Some thin-bedded limestone may also be ocean-floor sedimentary rock.

4/ Residual oceanic crust(ophiolite blocks): mainly found in the Jiaomuru area, including basalts, pillow basalt, diabase, gabbro, as well as ultrabasic rock and plagioclase granite.

5/ Ordovician-Devonian carbonate rocks: these are mainly include calcareous schists and low-grade metamorphic fine-grained clastic rock intercalated with crystalline limestone, etc. These rocks experienced complex structural deformation and tectonic transposition, to the extent that *Sinoceras* even exhibits boudinage due to ductile shear deformation.

6/ High-pressure metamorphic blocks: the rocks include grayish-white marble, white-mica marble, greenish-gray sericite quartz-schist, glaucophane-bearing epidote actinolite schist, garnet-bearing muscovite schists, glaucophane-bearing meta-basalts, meta-basalts, basalt schists and quartzite etc. The

main body of rocks consists of different kinds of crystalline limestone, marble, quartzite, and quartz-schist, which are intercalated with meta-basalts, basalt schists, and glaucophane-bearing schists. In addition, the basalts show the typical characteristic of ocean islands.

On the basis of regional contact relationships of the strata, isotopic dating and related magmatic rocks, we believe these accretionary complexes formed in the Indosinian Epoch.

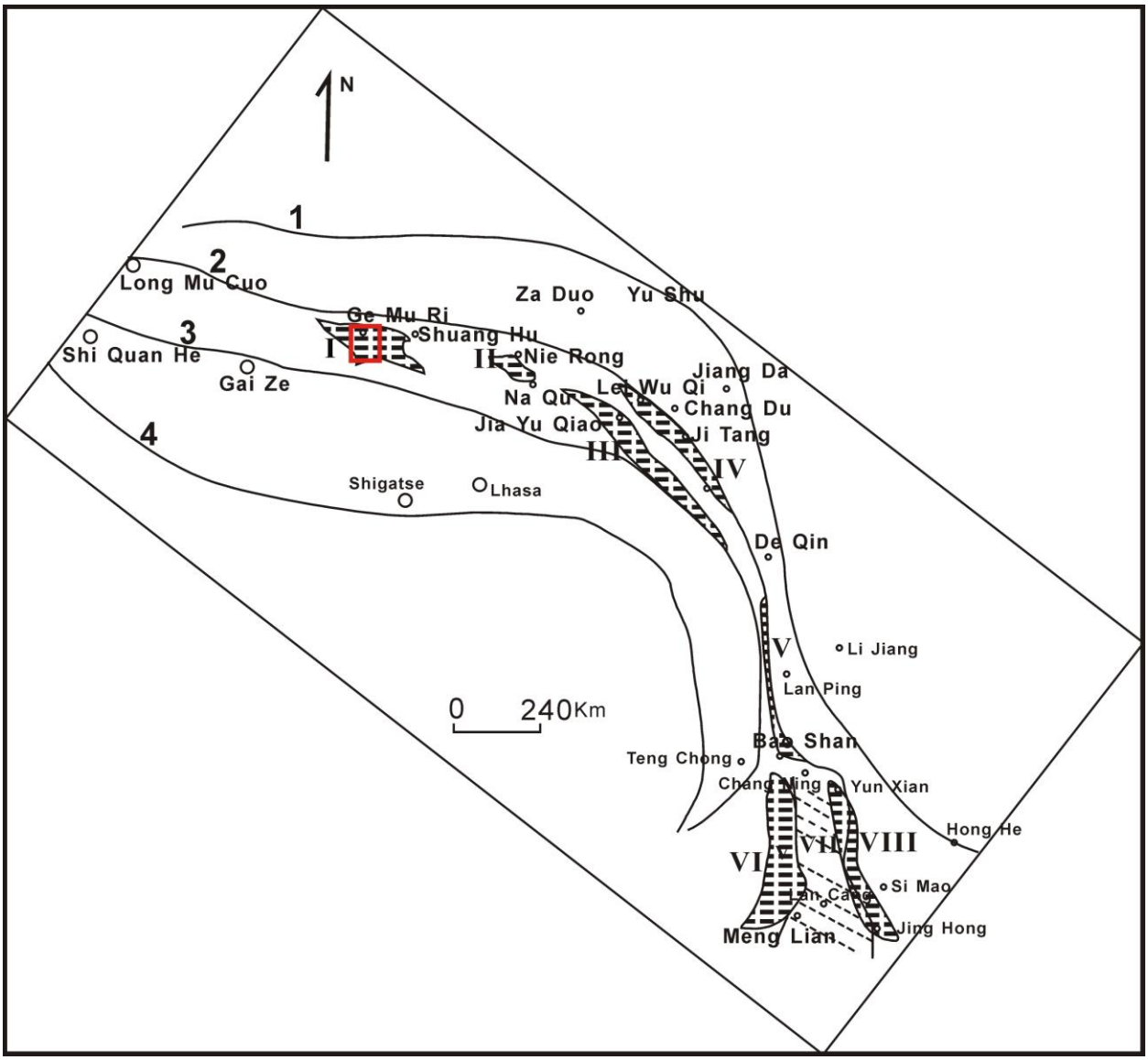

Figure 1. Tectonic map of the study area. Tectonic belts: 1. XijirUlan-Jinshajiang-honghe, 2. Longmucuo-Shuanghu-Lancangjiang, 3. Bangonghu-Nujiang, 4. Indus-Yarlung Zangbo. Metamorphic complexes: I. Gemuri, II. Nierong, III. Jiayuqiao, IV. Jitang, V. Yunling, VI. Ximeng-Mengtong, VII. Changning-Menglian, VIII. Jinghong.

References

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