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From orogenic collapse to rifting ; structures of the South China Sea

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The opening of the South China Sea has been a matter of debate for many years because of its internal structure, the differences between the conjugate margins and the variations of rifting and spreading directions. Although it is considered as being a back-arc basin, it is not sitting directly above a subduction zone, and the rifting process lasted for an unusually long duration.

Among the specific characteristics is the early phase of rifting which took place early in place of the former Yanshanian andean-type mountain range. This stage is marked by narrow basins filled with deformed conglomerate, and initiated around 70My ago within a framework where the oblique subduction marked by igneous activity and ductile wrench faults, was replaced by orogenic collapse. The rifting stage is marked by Eocene syntectonic normal faults and occasional volcanics centres and has proceeded from NW-SE to NS extension. The NW stretching created at least two aborted basins which remained at rift stage. Extension was followed by spreading from 33 to ~20 Ma in the South China Sea. The ocean floor spreading also changed direction to NW-SE with a propagator inside the Sunda shelf from 20 to 17My ago. However the propagator opening implies that deformation is also taken by rifting around a southern wedge which in turn created strain inside the thinned crust. Another extension parallel to the margin is also observed although the spreading was in process.

The southward motion of the southern conjugate margin was later accommodated by its subduction beneath the NW Borneo wedge until completion of the Proto South China Sea subduction.

Variations of rifting spreading through time and variations of structural styles are discussed in terms of boundary forces acting to the SE.