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## **Gigantic-thick turbidite succession in a Miocene fault-bounded trough of the South China Sea rifted continental margin: Examples from Taiwan**

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The Loshui Sandstone, a Miocene turbidite succession accumulated in the northern slope of the rifted continental margin of the South China Sea, is exposed in the Hengchun Peninsula, Taiwan. We conduct lithofacies analysis to understand the depositional processes and mechanisms of the gigantic-thick turbidite succession.

Several features can be recognized from outcrops: (1) the Loshui Sandstone is of around 1,000 m thick with turbidite units stacked vertically; (2) high net-to-gross ratio ( $> 0.9$ ) with dominant fine-to-medium grained sandstones, amalgamated beds are commonly found in the very thickly-bedded turbidites; (3) thick individual turbidite beds with a nominal thickness of 70 cm, which is thicker than classical Bouma sequence; and (4) limited deep scouring surfaces and thick mud are found. Two end-member lithofacies of high-density turbidites and low-density turbidites, respectively, are identified. High-density turbidites are thicker (more than 1 m thick) and coarser in grain size (mostly medium sands) with abundant massive intervals, dewatering structures and/or climbing ripples. Low-density turbidites tend to be thinner in thickness and finer in grain size (mostly fine sands) with parallel bedding and/or normal ripples. In addition to the above two lithofacies, chaotic deposits of mass transport deposits (MTDs) are also widespread within the studied succession.

Sand-rich, vertically aggrading succession, but lack of deep-scouring surfaces and levee deposits, indicates that turbidites are laid down by unconfined turbidity currents in a sand-rich deepwater lobe. In addition, gigantic thick turbidite unit stacked continuously up to 1,000 m, implying that the lobe is confined within a rapidly subsiding basin. We interpreted that the Loshui Sandstone is vertically stacked and accumulated within a fault-bounded trough in the deepwater area of the rifted continental margin of the South China Sea.