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Evidence of an ancient tsunami in a marine cave at Koh Phi Phi islands (Thailand)

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The december 26th tsunami in the Indian Ocean has severely damaged the Koh Phi Phi Island (Krabi-Thailand) a place that is famous for its karstic landscapes and diving spots on coral reefs. Enquiries and geomorphological observations indicate that the wave was 5 to 8 meters hight. In the Tonsay area, where the main human settlements are located, the inland penetration of the sea water was up to 300 meters from the seashore.

The main morphological effects were :
· denudation of the soil substratum,
· deposit of unclassified sand, coral clasts and shells,
· creation of a small cliff,
· important damage to corals at depths down to 20 m,
· mobilisation and alignement of important coral blocks in shallow waters.

Observations suggest the existence of a previous important tsunami in that area :
· the presence of ancient coral clasts in the soil,
· in two bore holes, coral clasts are present at a depth of 70 cm
· aerial views of the beaches and coral reefs before he tsunami show aligned structures

A more precise observation in a marine cave confirms it. Close to Koh Phi Phi, the small island of Phi Phi Ley contains a cave where bird nests are collected by sea Gypsies. The Tham Phaya Nak cave is a large chamber whose entrance is partially closed by large limestone blocks except at its northern part where the sea can reach the interior of the chamber. In that area, no evidence of the 26th december tsunami is noticeable, but a layer of older coral clasts is observable.

The size (up to 30 cm) and the position (flattened against stalagmites) of the clasts reveal the existence of a powerfull wave that entered far into the cave. Due to the important population of cave swallows, the soil is covered with guano. The relatively thin layer of guano over the clasts suggest a recent age.

Outside the cave the speleothems that are present on the limestone cliffs are frequently broken a few meters above the sea level. This could have also been provoked by powerfull waves.

Several historical or acheo-tsunamis are possible candidates to explain the damage, like the 1907 indonesian tsunami (Ms 7.80) or older events (600 yrs ago) whose effects have recently been observed in the coastal sediments of this area in Thaïland and Indonesia by differents teams.