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Diet and digestive microbial symbioses in amphipod crustaceans from deep-sea wood falls in the Pacific Ocean.

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Wood falls on the deep-sea floor are now recognized as an important food source sustaining particular ecosystems that are dominated by molluscs, annelids and crustaceans. These are often endemic species but many have taxonomic links with species of other reducing habitats. Recent studies pointed out the importance of Decapods (galatheid crabs of the genus *Munidopsis*, thalassinid shrimps) among which many species feed directly or indirectly on wood, participate in its degradation and harbour gut microflora that probably helps in its digestion (Hoyoux *et al.*, 2009; Hoyoux 2010). However, nothing is known on the small crustacean species such as amphipods despite they are regularly collected during the oceanographic cruises. Among these, amphipods of the genus *Onesimoides* appear linked to wood and probably belong to different species as supposed according to their morphology and geographic origin. The species identification is in progress by use morphological characters and molecular analysis (COI mitochondrial gene).

The aim of the present study is the comparison of the diet and the digestive microflora of *Onesimoides* sps. specimens from different geographic origins collected by the cruises Norfolk2 (New Caledonia), Salomon BOA (Solomon islands) and Panglao (Philippines). The gut content, morphology and microflora were compared in light microscopy as well as in scanning and transmission electron microscopy. Observations indicated that wood represent an important part of the gut content in all species. It appears as small fragments of thick vegetal cell walls suggesting the later are cut into pieces by the mouth parts or in the stomach. They show however only few traces of bacterial degradation before ingestion. The specimens from New Caledonia and Solomon Islands also have fungi hyphae in their gut content. In each species, the hindgut walls are armed with similar elongated cuticular spines and are colonized by bacteria showing the same morphology and distribution. These bacteria are of two morphotypes, elongated rods forming a monolayer in contact with the cuticle and short rods attached to the spines or forming a thick layer covering the other bacteria. In the specimens from New Caledonia, the anterior hindgut harbours elongated rods only whereas both morphotypes are present more posteriorly.

These observations strongly suggest that despite they are geographically distant to each other, the three probable *Onesimoides* species have a quite similar diet and harbour very similar bacterial microflora in their gut. They let us suppose that these microflora are resident and play a role in the digestion of wood or of its refractory compounds (cellulose, lignine) as it should be the case in several species of decapods (Hoyoux, 2010). On the other hand, the results highlight the possible roles amphipods in the degradation of sunken woods on the deep-sea floor and point out their importance in the wood fall ecosystem.

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References: Hoyoux C. *et al.*, Mar. Biol., 156 (2009) 2421-2439; Hoyoux C., ULgetd-11242010-182425, (2010) 343.