P059

Aquaporin in the salivary glands of the worker termites

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Subterranean termites favor higher humidity and the workers seek and carry water for their colony, utilizing it as a solvent for nest construction and gallery building and to maintain wetness for their nestmates. Such water management in a social organization relies largely upon the function of the workers in the colony, and on the individuals that control the location and movement of water inside their bodies. The movement of water via aquaporins (AQPs; water channels) into and out of cells is a key feature of the numerous physiological functions related to whole-insect water balance. We have characterized the homologue of the water-specific *Drosophila* AQP [*Drosophila* integral protein (DRIP)] in workers of the Formosan subterranean termite *Coptotermes formosanus* (Isoptera: Rhinotermitidae). Immunoblot analysis of DRIP-type AQP reveals that the Coptotermes DRIP with a molecular mass of approx. 25.7 kDa is expressed predominantly in the salivary (labial) gland of the workers. As evidenced by immunocytochemistry, the *Coptotermes* DRIP is present at deep invaginated basal plasma membrane of the parietal cells, opening to the duct of each acinar lumen. By contrast, there is no DRIP detected within the salivary glands of soldier termites, and neither caste expresses DRIP in their labial gland reservoir (water sac), a tissue which has been suggested to have a function as a water sink. A worker termite is an efficient lignocellulose decomposer. The AQP present in the salivary glands is of physiological importance in regards to salivation, aiding in the secretion of cellulolytic enzymes for wood ingestion by the workers of the subterranean termite. Furthermore, we found another type of AQP in the salivary gland of workers. It has been currently underway how the drywood termites regulate water under less wetness of their living environment.