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Recent advances in trail pheromones and sex pheromones in termites

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Because termites are blind, their communication largely relies upon chemical cues. Trail-following behaviour is mediated by trail pheromones, which mark the path from the nest to foraging sites. As for the mate localization, it is performed by sex pheromones. These last years, much progress has been made in the study of trail pheromones and sex pheromones in termites. The chemical structure of the female sex pheromone of *Zootermopsis nevadensis* and *Z. angusticollis* has been identified as (5E)-2,6,10-trimethylundeca-5,9-dienal and the male sex pheromone as syn-4,6-dimethyldodecanal. The trail pheromone of both species was shown to be composed of the same compound as the male sex pheromone. In female alates of *Hodotermopsis sjoestedti*, the major sex-specific compound was identified to be identical with the female sex pheromone of *Zootermopsis*. In male alates, the major sex-specific compound was identified as syn-4,6-dimethylundecanal, a homolog of the male sex pheromone of *Zootermopsis*. As for the trail-following pheromone of *H. sjoestedti*, it is syn-4,6-dimethylundecan-1-ol. These results highlight the conservative nature of the chemical communication in termites and an obvious chemical proximity in communication strategies between the Indomalayan termite *Hodotermopsis* and the nearctic termite *Zootermopsis*, which confirms the recent classification of both species in a new family, the Archotermopsidae. (10Z,13Z)-Nonadeca-10,13-dien-2-one has been recently identified as the trail pheromone of *Glossotermes oculatus* and *Serritermes serrifer* which confirms the close relationship between both species and the recent transfer of *Glossotermes* genus in this family. These results show that trail pheromones generally consist of a single compound in basal termites, while multi-component trail pheromones have been identified very recently in the advanced termites (Termitidae). A mixture of (3Z,6Z)-dodeca-3,6-dien-1-ol and (3Z)-dodec-3-en-1-ol is the female sex pheromone and the trail pheromone of *Odontotermes formosanus* (Macrotermitinae) whereas the trail pheromone of *Inquilinitermes microcerus* (Termitinae) and of all Nasutitermitinae studied consists of neocembrene and (3Z,6Z,8E)-dodeca-3,6,8-trien-1-ol.