

THE ICOMM LIPID DATABASE ON MARINE MICROORGANISMS

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At the present, a number of databases exist that comprise information on the biochemical components of marine microbes. The most commonly used database is that of the NCBI and comprises mainly genomic and proteomic data. However, a comprehensive data collection for marine microbial lipids is still absent. For that reason, the International Consensus of Marine Microbes (ICoMM) will develop a lipid database that will be instrumental in the identification of marine microbial life and concomitantly the inventory of marine microdiversity. This work will significantly contribute in the interpretation of biomarker and fossil lipid data. In this abstract we show a screenshot of the program, in the poster we will demonstrate the basic features of the database in more detail.

The screenshot displays the ICOMM Lipid Database interface. On the left, under 'Chemical Property', there are search filters for Rings (Value: 5), C-atoms (Value: 23), H-atoms, O-atoms, N-atoms, S-atoms, Acids, Alcohols, Branching, Cyclic, Double bonds, Ester bonds (None, Mono, Di, Tri, Poly), Ether bonds, Oxogroups, and Special. On the right, under 'Lipids selected 1 of 76', a list of lipids is shown, including Methyl ester ladderane C23 5 rings, 2-methylbacteriohopanepolyol 1 (C31), 2-methylbacteriohopanepolyol 2 (C32), 3-methylbacteriohopanetetrol, 4,13-dimethyl C17 Alkane, 4,4-dimethylcholesta-8(14),24-dien-3b-ol, 4,4-dimethylcholesta-8(14)-en-3b-ol, 4-methyl C17 Alkane, 4-methylcholesta-8(14),24-dien-3b-ol, 4-methylcholesta-8(14)-en-3b-ol, 5,12-dimethyl C17 Alkane, 5,6-dimethyl C17 Alkane, 5-methyl C17 Alkane, 6-methyl C17 Alkane, Alcohol ladderane C20 4 rings, Alcohol ladderane C20 5 rings, Alcohol Ladderane C22 4 rings, Alcohol ladderane C22 5 rings, Archaeol, Beta-amyrine, Beta carotene, Beta isorenieratane, C17 Alkane, C18-C18 glyceroldiether, C18 glycerolmonoether, C25:3 A HBI, C25:3 B HBI, C27 12 hydroxy methyl alkanoate, C28 1,14 diol, C28 1,15 diol, C29 12 hydroxy methyl alkanoate, C30 1,14 diol, C30 1,15 diol, and C30:5 HBI. A 'Usage' link is visible in the top right corner.

Figure 1A

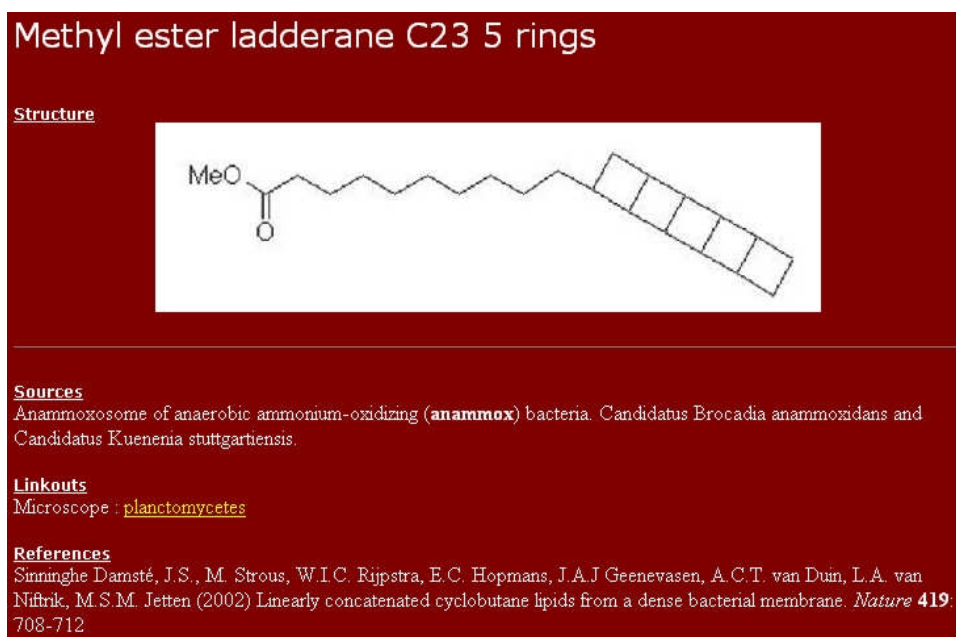


Figure 1B

Figure 1. Images of the pilot version of the ICoMM lipid database. (A) The result of a search for a lipid fragment with 23 carbon atoms and 5 ring structures. (B) Additional information about the structure of interest, *e.g.* the molecular structure, source and relevant literature.

In the future we will expand this lipidomics database and improve the user interface. A recent proposed lipid classification (Fahy *et al.*, 2005) and the Lipid Maps database will be used as guidelines to supplement the many lipid structures that are unique in marine microbial life.

Presently there are several other lipid databases to which we will connect our database:

PubChem Compound (www.ncbi.nlm.nih.gov)

Lipid Library (www.lipidlibrary.co.uk)

LIPID BANK for Web (www.lipidbank.jp)

LIPID MAPS - LIPID Metabolites and Pathways Strategy (www.lipidmaps.org)

The European Lipidomics Initiative (www.lipidomics.net)

REFERENCES

Fahy E., Subramaniam S., Brown H.A., Glass C.K., Merrill A.H., Murphy R.C., Raetz C.R.H., Russell D.W., Seyama Y., Shaw W., Shimizu T., Spener F., van Meer G., VanNieuwenhze M.S., White S.H, Witztum J.L., Dennis E.A. (2005) A comprehensive classification system for lipids. *Journal of Lipid Research*, **46**, 839-861.