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Food and soil-borne Penicillia in Arctic environments: chemical diversity

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Penicillia are very common inhabitants of cold environments, including arctic soil, plants, animals, and foods. We have investigated the mycobiota of Greenland inland ice and soil, and found a very unique and pronounced diversity among the Penicillia. Nearly all species were new to science, and only few well known *Penicillium* species were found. Most of the soil-borne Penicillia grew very poorly, if at all, at 25°C and could not sporulate at that temperature. Only one species of this kind has yet been described, *Penicillium jamesonlandense*, but there are at least 20 new species of this kind. The species found in inland ice were both of the soil-borne type, and Penicillia that grow and sporulate well at 25°C. The latter group of Penicillia have been found earlier in refrigerated foods, including *P. nordicum*, and in glacier ice and melting water from Svalbard (se Sonjak et al., this conference). This “food-borne group” of arctic fungi also contained some new species, but not as many as in arctic soil. The chemical diversity of the *Penicillium* species was remarkably high and in most cases even larger than the chemical diversity of Penicillia in the tropics. Several new secondary metabolites were found and known secondary metabolites with pronounced bioactivity were also found in most species, such as chrysogine, compactin, cyclopenin, kojic acid, mycophenolic acid, penicillic acid, pseurotins, pyripyropens etc.