Cold-active xylanase produced by fungi associated with Antarctic marine sponges

Del-Cid, Abdiel

Ubilla, Pamela

Ravanal, María Cristina

Medina, Exequiel

Vaca, Inmaculada

Levicán, Gloria

Eyzaguirre, Jaime

Chávez, Renato

Despite their potential biotechnological applications, cold-active xylanolytic enzymes have been poorly studied. In this work, 38 fungi isolated from marine sponges collected in King George Island, Antarctica, were screened as new sources of cold-active xylanases. All of them showed xylanase activity at 15 and 23 C in semiquantitative plate assays. One of these isolates, Cladosporium sp.; showed the highest activity and was characterized in detail. Cladosporium sp. showed higher xylanolytic activity when grown on beechwood or birchwood xylan and wheat bran, but wheat straw and oat bran were not so good inducers of this activity. The optimal pH for xylanase activity was 6.0, although pH stability was slightly wider (pH 5-7). On the other hand, Cladosporium sp. showed high xylanase activity at low temperatures and very low thermal stability. Interestingly, thermal stability was even lower after culture media were removed and replaced by buffer, suggesting that low molecular component(s)