

Article

Optimal Production of Protein Hydrolysates of By-products of Monkfish, Chemical Features and Associated Biological Activities.

José Antonio Vázquez ^{1,2,*}, Araceli Menduïña ^{1,2}, Margarita Nogueira ^{1,2}, Ana I. Durán ^{1,2}, Noelia Sanz ^{1,3}, and Jesus Valcarcel ^{1,2}

¹ Grupo de Biotecnología y Bioprosesos Marinos, Instituto de Investigaciones Marinas (IIM-CSIC), C/Eduardo Cabello, 6, CP 36208, Vigo, Galicia – España; jvazquez@iim.csic.es (J.A.V.); araceli@iim.csic.es (A.M.); marga@iim.csic.es (M.N.); anais@iim.csic.es (A.I.D.); nsanz@iim.csic.es (N.S.); jvalcarcel@iim.csic.es (J.V.)

² Laboratorio de Reciclado y Valorización de Materiales Residuales (REVAL), Instituto de Investigaciones Marinas (IIM-CSIC), C/Eduardo Cabello, 6, CP 36208, Vigo, Galicia – España

³ Laboratorio de Bioquímica de Alimentos, Instituto de Investigaciones Marinas (IIM-CSIC), C/Eduardo Cabello, 6, CP 36208, Vigo, Galicia – España

* Correspondence: jvazquez@iim.csic.es; Tel.: +34-986-231930 (J.A.V.)

Supplementary Material

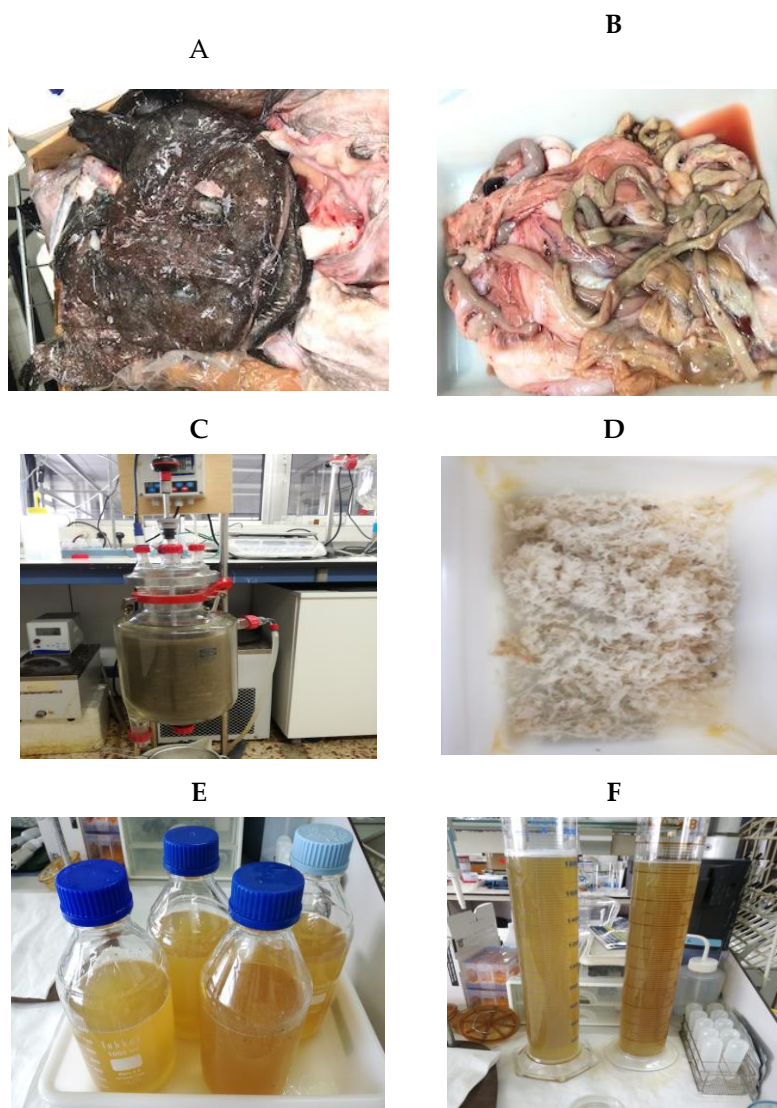


Figure 1. Pictures of monkfish substrates and hydrolysates: A) heads, B) viscera, C) Alcalase hydrolysis of monkfish wastes in a 5L-pH-stat reactor, D) clean bones recovered, E) head liquid FPH, and F) viscera liquid FPH.

Table 1. Experimental domain and coding of the independent variables in the factorial design executed to study the joint effect of pH and temperature on the Alcalase hydrolysis of monkfish heads.

Coded values	Natural values	
	pH	T (°C)
-1.41	6.0	30.0
-1	6.6	37.3
0	8.0	55.0
+1	9.4	72.7
+1.41	10.0	80.0

Codification: $V_c = (V_n - V_0) / \Delta V_n$
Decodification: $V_n = V_0 + (\Delta V_n \times V_c)$
 V_n = natural value of the variable to codify
 ΔV_n = increment of V_n for unit of V_c
 V_0 = natural value in the centre of the domain
 V_c = codified value of the variable

Constant conditions
Agitation = 200 rpm
r (S:L) = 1:1
[Alcalase] = 0.2% (v/w) or 4.8 AU/kg of heads
time of hydrolysis = 3 h