

Valorization of fish processing by-products: microstructural, rheological, functional, and properties of silver carp skin type I collagen

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Supplementary Materials

Figure S1. Amino acid sequence of *Hypophthalmichthys molitrix* type I collagen subunit $\alpha 1$. Bold red peptides: Matched peptide in the NCBI database.

Figure S2. Amino acid sequence of *Hypophthalmichthys molitrix* type I collagen subunit $\alpha 2$. Bold red peptides: Matched peptide in the NCBI database.

Figure S3. Zeta potential of SCSC.

1 MFSFVDIRLA LLLSATVLLA RGQGEDDRTG GSCTLDGQVY NDRDVWKPEP←
51 CQICVCDSGT VMCDEVICED TTDCPNPVIP HDECCPVCPD DDFQEPSVEG←
101 PRGTPGEKGD RGPPGPPGND GIPGQPLPG PPGPPGPPGL GGNFSPQMSG←
151 GFDEK**SGGAM AVPGPMGPMG PRGPPGPPGT** PGPQGFTGPP GEPGEAGAPG←
201 PMGPRGAAGP PGKNGEDGES GKPGRPGERG PPGPQGARGF PGTPGLPGIK←
251 GHR**GFSGLDG AKGDTGPSGP KGEAGAPGEN** GTPGAMGPRG LPGERGRAGP←
301 PGAAGARGND GAAGAAGPPG PTGPAGPPGF PGGPGAK**GEV GPQGARGAEG**←
351 PQGARGEAGN PGPAGPAGPA GNNGADGAAG PKGSPGTPGI AGAPGFPGPR←
401 GPPGPSGAAG APGPKGNTGE VGAPGAKGEA GAKGEAGAQQ VQGPPGPPGE←
451 EGKRGARGE P GAAGGR**GPPG ERGAPGARGF** PGADGSAGPK GAPGERGGPG←
501 VVGPK**GATGE PGRNGEPMG GSKGMTGSPG SPGPDGKTGP SGTGQDGRP**←
551 **GPPGPVGARG** QPGVMGFPGP KGAAGEAGKP GER**GVMGAVG ATGAPGKDGD**←
601 VGAPGAPGPA GPAGERGEQG PAGPPGFQGL PGPQGATGEP GKSSEQGLPG←
651 EAGAPGPSGS RGDGRFPGER GAPGPAGPAG ARGSPGSAGN DGAKGDSGAP←
701 GAPGAQGPPG LQGMPPERGA AGLPGLKGDR GDQGA**KGTDG APGKDGI**RG←
751 TGPIGPPGPA GAPGDKGETG APGLVGPAGA RGPPGERGET GAPGPAGFAG←
801 PPGADGLPGA **KGEAGDN**AK **GDAGPPGPSG ATGAPGPQG**P **VGATGPKGAR**←
851 GAAGPPGATG FPGAAGRVGP PGPAGNAGPP GPPGPAGKEG QKGSRGETGP←
901 AGRTGEIGTP GPPGAPGEK**G TPGAEGPTGP SGTGPGQGIN** **QQRGIVGLPG**←
951 **QRGERGF**PGL PGPSGEPGK**Q GPSGSPGERG PPGPMGPPGL** **AGPPGEPGRE**←
1001 **GTPGNEGSAG** RDGAPGPKGD RGETGAAGTP GAPGPPGAPG PIGPACK**TGD**←
1051 **RGESGPAGPS GAVGLTGPRG PVGPAGARGD** KGETGEAGER GMKGHRGFTG←
1101 IQGPPGPPGP SGEPGPAGAS GPAGPRGPAG SSGPAGK**DCM SGLPGPIGPP**←
1151 **GPRGRNGEIG** PAGPPGAPGP PGPPGPSGGG FDIGFIAQPQ EKAPDPFRHF←
1201 RADDANVMRD RDLEVDTTLK SLSQQIESIM SPDGTKKNPA RTCRDLKMCH←
1251 PDWKSGEYWI DPDQGCNQDA IKVYCNMETG ETCVYPTST IPKKNWYTSK←
1301 NIKKKHVWF GEAMTDGFQF EYGSEGSKAE DVNIQLTFLR LMSTEASQNI←
1351 TYHCKNSIAY MDQASGNLKK ALLLQGSNEI EIRAEGNSRF TYSVTEDGCT←
1401 SHTGAWGKTV IDYKTTKTSR LPIIDIAPMD VGAPNQEFGI EVGPVCFL←

Figure S1. Amino acid sequence of *Hypophthalmichthys molitrix* type I collagen subunit $\alpha 1$. Bold red peptides: Matched peptide in the NCBI database.

1 MLSFVDTRIL LLLAVTSYLA SCQSSTRGPK GPRGERGPKG PDGKPGKPGL←
 51 PGPPGPPGPP GLGGNFAAQY DGAK**GIEAGP** **GPMGLMGPRG** PSGPPGAPGP←
 101 QGFQGHAGEP GEPGQAGAVG SRGPPGPPGK NGEDGNNGRP GKPGDRGAPG←
 151 AQGARGFPGT PGLPGMKGHR **GYTGLDGRKG** EPGAAGAKGE NGAPGSNGTP←
 201 GQRGGRGLPG ERGR**VGPSGP** **AGAR**GADGNI GPAGPAGPLG AAGLPGFPGA←
 251 PGP**KGEIGPA** **GPTGPSGPQG** **QR**GEPGTNGA VGPAGPPGNP GANGINGAKG←
 301 AAGPPGVAGA PGFPGPRGGP GPQGPSGASG PR**GLAGDPGP** **VGVKGD**SGVK←
 351 **GEPGSAGPQG** **PPGPSGEEGK** **RGSTGEQGST** **GPLGMR**GPRG AAGTRGLPGL←
 401 AGR**SGPMGMP** **GARGAT**GAPG ARGPPGDAGR **AGEPGLVGAR** GLPGSPGSSG←
 451 PPG**KEGPAGP** **AGQDGRSGPP** **GPTGPR**GQPG NIGFPGPKGP SGEPGKPGEK←
 501 **GPTGPTGLRG** QPGPDGNNGP PGPVGLAGAP GEKGEQGPGS APGFQGLPGL←
 551 AGPAGEAGKS GDR**GIPGDQG** **AQGPAGVKGE** **RGNPGPAGAA** **GAQGPIGARG**←
 601 **PAGTPGPDGN** **KGEPGA**VGAA **GAAGHQGAAG** **MPGER**GAAGT PGP**KGEKGEQ**←
 651 GYR**GLEG**NAG **RDGARG**APGP SGPPGPAGAN GDKGETGSFG PPGPAGARGA←
 701 PGER**GESGPA** **GPSGFAGPPG** **ADGQTGQRGE** KGPAGVKGDA GPPGPAGPAG←
 751 NTGPLGPSGP VGPPGARGDS GPPGLTGFPG AAGRVGPPGP SGIVGPAGPT←
 801 GAPGKDGPGR AR**GDVGPAGP** **PGENGMMGPP** **GLAGEK**GSPG ESGAPGAPGP←
 851 AGPQQQLGSQ GFNGLPGSRG DRGLPGGPGA VGDAGRVGPA GAPGAR**GPAG**←
 901 **NIGMPGMTGP** **QGEAGREGSP** **GNDGPPGRPG** **AAGLKGD**RGE PGSPGAAGPV←
 951 GAPGPNGPSG AVGRPGNR**GE** **SGPSGSSGPV** **GPAGARGAPG** **PAGPR**GEKGV←
 1001 AGDKGERGMK GLRGHPGLQG MPGPNGPSGD SGPAGIAGPA GPR**GPAGPNG**←
 1051 **PPGK**DGSNGM PGAIGPPGHR GPPGYVGPAG PPGSPGLPGP PGQAGGGYDT←
 1101 SGGYDEYRAD QASLRAKDYE VDATVKSLNT QIENLLSPEG SKKNPARTCR←
 1151 DIRLSHPEWS SGFYWIDPNQ GCTMDAIKAY CDFSTGQTCI HPHPESIPQK←
 1201 NWKSSQEKK HIWFGETING GTEFSYNDET LSPQSMATQL AFMRLLANQA←
 1251 VQNITYHCKN SIAYMDAENG NLKKAVLLQG SNDVELRAEG NSRFTFSVLE←
 1301 DGCSRHTGQW GKTVIEYRTN KPSRLPILDI APLDIGGADQ EFGLDIGPVC←
 1351 FK←

Figure S2. Amino acid sequence of Hypophthalmichthys molitrix type I collagen subunit $\alpha 2$. Bold red peptides: Matched peptide in the NCBI database.

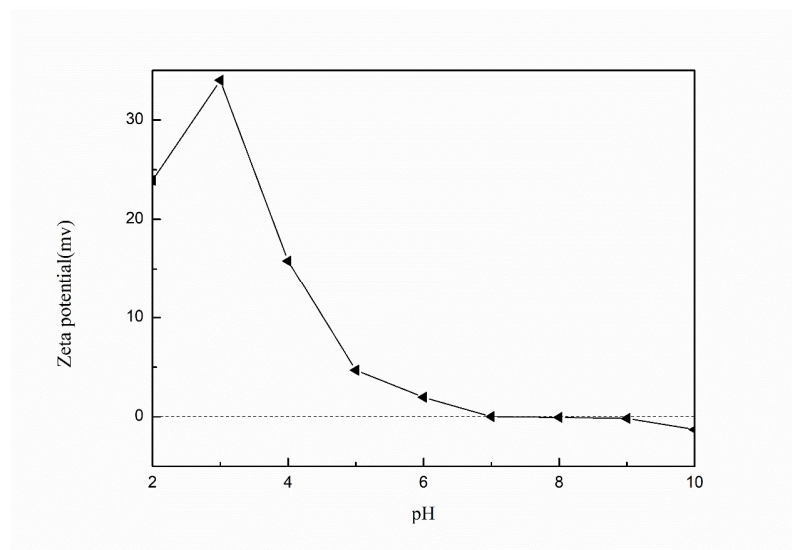


Figure S3. Zeta potential of SCSC.