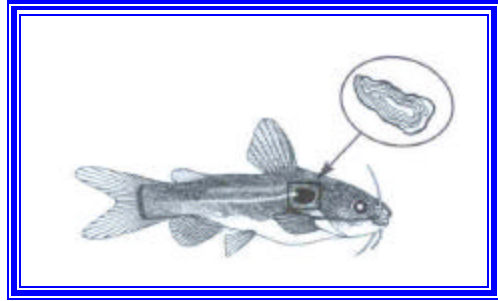


# fptgRtecokRtl (Otoliths)



eday<sup>3</sup> exn htfl (Kent Hortle)

maneRchenAkjRtecokRtCagCbRbThenAkjEPfk

qlyBBPBdsfmsqt; CMTkrbs;TenomKgKCaTKEngmYdZdGr Edl manRtCaerChRbePTTak;  
TgKaedayRbePTensemgdZessdtCa semgERsk-dtsemgRCik; semgK<sup>2</sup> rsemgg<sup>2</sup>gt<sup>2</sup>.  
RtbeBaj<sup>2</sup>stj kensemgPaKerchedm,IsMal nURbePTRbsBKva. semgrbsRbePTRtkdenAeBl  
Edl vabnLgshbedayj eQpl KQaceFGayBxajl prhteTAdl Rcalj Edl CastbcMl k nigKY  
eGayRBMk,al enAeBl ybsqt;. cMnkÉRtcbAndeBj niymmYRbePteTotKWTkRBakknlyRkhhm  
(*Botia modesta*) eFGayrPbcitpl masrbsvaeday sarEt karbeBaj<sup>2</sup> semgd<sup>2</sup>rbbsva.

bInpdm,Isbbsemg)anRtTadjenHTamTarRtUmanRtecok yagChtaj . RtmanRbBjRtecokxagkj  
dZsaly aWl manqlyfRtecokbeglt eGaymansmasPaBCaKnmmY. qlyfRtecokCaRbBjQyEdl eFV  
eGayRtGacTTV sphonur l ksemgx<sup>2</sup>Ka)anyagerChCagragkayrbsva. c l naepSg<sup>2</sup>Karbs;fp  
qlyRtecokRteFGaykMkeramenAkjRtecokEdl CakarBab<sup>2</sup>sarBRbBjRbsaTeTakanYk,al . Rt-  
ecokxagkj<sup>2</sup>kan sarsManxajNasEdrshbeFGaymanl Mgdl qlyfRtecokedaybeglt)anCa  
sdl énglgesatvBaN ehlycl narbsqlyfRtecokbeglt eGayxYk,al dg)annUBkarrKtis nigkar  
karbW as;TeTAmx.

fptgRtecokKWTU)anGkCvsaRsbRbR)asyagsManenAtamdMnRsavRCa/CaerCh. fptgRtecok  
RtRtU)anekeRbR)asCaerChTsvtSmkehlyshokNNtGayRtl BBRBahvadHl tl l aserchrWicddKa  
nigkar l tl l asrbsRtedr ehlyeday sarEtvamanRbBjRbRbV dZc bpt rWarkménRbttGln nig  
kal suthkabN atEdl manragCadWly; (called annuli). dWly)anKlsdkepkCaerogral éf<sup>2</sup>denH  
ehlyeTbGaceGayekrabkNNt;)annUGayrbsRtekgbpt.

ral karBnitüKWTU)aneKemil eTae l KMBcabfQnAeBl NaEdl RtBMSumankar l tl l as; edaykar  
BnitüPaKerch)anbgaj eGayeXlj famanRbePTRtmYcMhmankMt l tl l asyWenArdUrgar eBl

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enaHehlyEdI vabeglteGaymanrggRbcakMms<sup>2</sup>KaEdI CasBa@Nbgaj nUGaymmsRtl. RbePT  
RtRtBkKwankarI MakeRchedm, bFKarkMntGayubsya dtenHkarBnitüGacRtU)aneKeF#TAtamrdU  
rW#F#dayktpepSg<sup>2</sup>eTotEdI karI tI asenahBMTAtamFmpta.

rbragrbs,fpjgRtecokERbRbVl xisKaëTAtamRbePTRtlehlyvartU)annM ayyagyWbpt dëcHehly  
eTboavenAmansI )anyagydenAkjgeBalevonrbsBBKRbePTsIsacCaGahar EdI GaceF#GayBBK  
GkCl/saRs(GackMnt);annURbePTRtEdI RtU)ansedayBBKRtlr#stEdI sIsacCacMEnah.

kareRbR)as,fpjgRtecokRtIfenHPaKerch)anpI nUGtRbeyaCnBIsmasFatubsya EdI ERbRbVl  
eTAtamkarsenArbsRtCamYnngsarFatKMEdI manenAtambrisAnxis<sup>2</sup>Kaenah. smmaRténvtö  
FatUadLayEdI manenAkjgfpjgRtecokRt)anpI eGaynUsBaxs<sup>2</sup>KaEdI GaceGayeKeRbR)as;  
edm, bgaj BpI sKEdI )anviDAnenAkjgbrisAnxis<sup>2</sup>Ka nigGacbgaj eGayeXlj faetRt)ancMnay  
eBl bmanrsenAkjgsm&T. becReTsenHrtU)aneRbR)asedm, bgaj eGayeXlj famanRt)aTenö  
emKgAnY/RbePT (*Pangasius Krempfi*) aneRbR)asmlyEpkénClvitdldgrbsyaenAkjgsm&T. fpjg  
RtecokkZaceF#GaydgEdrBbN#hsarFatBU enAkjgbrisAn Tnnngenhvak#anRbeyaCn#s#mbeFV  
Casn#S#s#EvqBCvitr#senArbsRt#pgEdr.

karGnutp#anAeBl f#enH)anBgEpkeTaeI karvPaKBll MgGaysttö (*isotopes*) enAkjgfpjgRtecok  
Rtl. fpjgRtecokRtRbmU p#n#p#p<sup>2</sup>)annUcm#smmaRtEdI ERbRbVl rbsGaysttöGksEsnEdI  
mankMtxs<sup>2</sup>KaenAkjgkMstInPaBxIs<sup>2</sup>KaEdr dëcHehlyeTbfpjgRtecokRtGacbgaj eGaydgBl  
stInPaBrbs;TikenAeBl EdI RtrsenA. bccö,nänH h#U fpjgRtecokRtRtU)aneKeRbR)asedm,I  
kMntnukMstInPaBBberRbvt#

smmaRtes#PaBrbsGaysttöGackMnt);anfaetRtCaBBktInsl -s#og;t#CaGahar! RbePTslu  
cM r#CaBBksIsacCaGahar ehlykZaRbPBénrsIsMyaKRkad#denAkjgsgkQamEdI vartUkar  
pgEdr -]TahrN#kCa BBksaray r#bePTRkCatifakxsEdI CaGaharsMans#bRtrsenA;  
EdI T#GsenHehlyCakarGnutp#anRbeyaCn#yagF#g#BalkarRkb,RKgvIs#yC I pI .