APPENDIX 1.6.0

Type a9/b1,(±2±3±5±7±8±9±10±11±12)

Outline approximately triangular with a straight or curved axis. Neither margin has prominent flexure. A transverse line may separate crown and base.

List of Tofino Basin subtypes a9/

Tofino Basin triangular teeth of the subtype a9 are organized into four groups: 1) elasmobranch teeth; 2) triangular teeth with canals; 3) triangular flanged teeth; and 4) cone teeth. They are then ordered by the coded sequence.

Elasmobranch teeth, subtype a9

a9/b2+8+12/c19/d19/e1/f1/g6+7+8/h0/i6,7/j6,7/k0,1/m0/n0,~1/p0/q0/r0/s3/t4/z0 Family Scyliorhinidae Form A

a9/b8/c19/d19/e1/f1/g7/h0/i9/j9/k1/m0/n>1.2/p0/q0/r0,1/s0/t4/z1,2 *?Isurolamna* sp. A

a9/b8+11±12/c14+19/d19/e1/f(4a+b)+9+11+14/g7+8/h3/i2,9/j2,4,9/k5,8,9/m0/n≥0.8/p0/ q9,10/r1/s1,2/t4/z0 Family Squalidae Form D

a9/b8±12/c(12,13)+(16,17)+19/d(1,16,17)+19/e1/f(4a+b)+9+11+14/g7+8/h3/i4/j2,3/k5,8,9/m0/n≥1/p0/q9,10/r1,2/s1,2/t4/z0 Family Squalidae Form E

a9/b8±12/c(12,13)+19/d14+19/e1/f(4a+b)+9+11+14/g7+8/h3/i3,4/j3,4,10/k5,8,9/m0/n≥1/p0/ q1,9,10/r1,2/s1,2/t4/z0 Family Squalidae Form A

a9/b8±12/c12+19/d19/e1/f(4a+b)+9+11+14/g7+8/h3/i4/j2,6/k5,8,9/m0/n≥1/p0/ q9,10/r1,2/ s1,2/t4/z0 Family Squalidae Form B

a9/b8±12/c13±14+19/d19/e1/f(4a+b)+9+12+14/g7+8/h1,5,4,3/i2,4/j2,6/k5,8,9/m0/n~≥0.7/ p0/q9,10/r1,2/s3/t4/z0 Suborder Hexanchoidei Form B

a9/b8±12/c14+19/d±13+19/e1/f(4a+b)+9+(11,12)+14/g7+8/h3/i2,3,9/j2,3,4,9/k5,8,9/m0/n≥1/p0/q9,10/r1/s1,2/t4/z0 Family Squalidae Form C

a9/b8±12/c14+19/d19/e1/f(4a+b)+9+(11,12)+14/g7+8/h1,3,4,5/i3,9/j6,7,8/k5,8,9/m0/n~≥1/ p0/q9,10/r1/s1,2/t4/z0 Suborder Hexanchoidei Form A

a9/b8±12/c19/d19/e1/f(4a+b)+9+(12,13)+14/g7±8/h1,5/i2,3/j2,3/k5,8/m0/n≥1/p0/q9,10/r1/s1,2/ t4/z0 Suborder Hexanchoidei Form C

Unidentified elasmobranch teeth, subtype a9

a9/b2+8+12/c19/d19/e1/f(4a+b)+9+(12,13)+14/g4+7+8/h1,2,4,5/i3,9/j6,7/k5,8,9/m0/ n0≥1/ p0/q9,10/r1/s1/t4/z0 Unidentified elasmobranch tooth Form A

a9/b2+8+12/c19+20/d19+20/e1/f1/g6+7+8/h1,5/i7/j7/k0,1/m0/n~1/p0/q0/r0/s2/t4/z0,1 Unidentified elasmobranch tooth Form E

a9/b8/c19+20/d19+20/e1/f(4a+b)+9+(11,12)+14/g7/h1,5/i6,7,8,9/j6,7,8,9/k8/m0.05-0.35/ n1.2-2.0/p0/q9,10/r1/s3/t4/z0 Unidentified elasmobranch tooth Form B

a9/b8±12/c13+19/d13+19/e1/f(4a+b)+9+(12,13)+14/g7+8/h1,5/i9,10/j9,10/k8,9/m0/ n>1.5-3/p0/q9/r1/s3/t4/z0 Unidentified elasmobranch tooth Form C

a9/b8±12/c19/d19/e1/f±(4a+b)+9+(11,12)+14/g7±8/h1,5,4/i2,6,9/j2,6,9/k8,9/m0/ n>2/p0/q9,10/r1/s0,1,2/t4/z0 Unidentified elasmobranch tooth Form D

Triangular teeth with canals

a9/b1,5/c11,12/d20/e1,2/f1±4a+b/g1/h0,4,5/i2,3,4,9/j2,6,7,9/k1/m0/n>1.5/p0,>1.5/q0,9,10/ r0,1/s1,2/t2/z0,2/cc1/dd1/ee2/ff1/gg1,4/hh0,1-4/jj2,3/kk2,4/mm0,1-3/nn0,0.3-1.0 angled cone and basal canals new subtype

a9/b5+8/c19±(11,12,13)/d19±(11,12,13)/e2/f4a±b/g7±8/h0,1,2,3,4,5/i2,3,4,5/j2,3,4,5/ k8±(12,14)/m0.04-0.35/n≤2/p0/q0,3,4,5,9,10/r0,1/s1,3/t4/z10,11/cc5/dd5/ee2/ff0/gg6±8/hh0-1.3/jj2/kk2/mm0.44/nn0.3 centrally inflated triangle with canals new subtype

a9/b5+8/c13+19/d13+19/e2/f4a±b/g7/h0/i2,4/j2,4/k1/m0/n>1<2/p0/q0/r0/s1/t4/z7,11,12/cc5/dd5/ ee2/ff1/gg4+6/hh2.0-2.5/jj3,6/kk5,6/mm2.0-2.5/nn<0.3 triangle one canal above Doyle et al., 1974; and Doyle and Riedel, 1979a, p. 193

a9/b5+8/c13 +19/d13+19/e2/f(4a+b)±(8,22)/g7/h0,1,5/i2,4/j2,4/k1,12/m0,0.02-0.4/n1.9-2.5/p0/q0,6,7/r0,3,4/s1,3/t4/z4,7 cf. triangle transverse line across Doyle et al., 1974; emend. Doyle and Riedel, 1979a

a9/b5+8/c19/d19/e2/f4a+b/g7/h0,1,4,5/i2/j2/k1,12/m0,0.02-0.4/n1.9-2.5/p0/q0,3,6/r0,1,3,4/ s1,3/t4/z4,10,11 triangle transverse line across Doyle et al., 1974; emend. Doyle and Riedel, 1979a

a9/b8/c19/d19/e2/f1,(4a ±b)/g7/h0,1,4,5/i2,3,5/j2,3,5,6/k1,8/m0.1-0.5/n>1.5/p0/q9,10/r1/ s1,3/t4/z0 flanged triangle with canals new subtype

Triangular flanged teeth

a9/b1/c1/d1/e1/f4a±8/g1/h1,5/i5,9,10/j2,5,9,10/k1,8/m0.09-0.5/n≤2/p0/q2,9/r1/s4/t3/z0 triangle chisel-top new subtype

a9/b5+8/c(9,13)+19/d(9,13)+19/e1/f(9,10)+12+(14,15)/g7/h1,5/i3,4/j6,10/k5,7/m0.85-0.9/n>2/p0/q0,2,6/r0,1,4/s1/t4/z0,7,11 cf. triangle notched corner Doyle et al., 1974

a9/b5+8/c13+19/d13+19/e1/f1,4a/g7/h1,5/i2/j2/k7,8±12/m0/n0,>2/p0,>2/q1,2/r1,4/s0/t4/z0 beveled triangle high inline Doyle et al., 1978

a9/b5+8/c±13+19/d±13+19/e1/f4a+b/g7/h0,1,5/i1,4,5,10/j1,4,5,10/k3/m0.2-0.4/n1.4-2.0/ p0/q0,2/r0,1/s3/t4/z0,2 cf. triangle bowed inline Ramsey et al., 1976; emend. Doyle and Riedel, 1979a

a9/b5+8/c13+19/d13+19/e1/f4a+b/g7/h0,1,5/i2,4/j2,4/k3/m0.4-0.7/n1.2-2.0/ p0/q0,6,7/ r0,3/s1,3/t4/z4 triangle modified margin ends Doyle and Riedel, 1985b

a9/b5+8/c+13±19/d+13+19/e1/f4a+b/g7/h0,1,5/i2,4/j2,4/k5/m0.65-0.85/n<2/ p0/q0,2,6,7/ r0,1/s1,3,4/t2,4/z2,4/cc1/dd1/ee1/ff0/gg4/hh1.0-1.5/jj2/kk2/mm1/nn1 cf. simple triangle Winfrey et al., 1987

a9/b5+8/c13+19/d13+19/e1/f4a+b/g7/h0,1,5/i4/j4/k0/m0/n1-1.5/p0/q0,7,8/r0,3,4/s1/t2,4/ z4,7,11/cc1/dd1/ee1/ff1/gg3+4/hh2-3/jj3/kk4/mm1.5-3.0/nn0.2-0.5 cf. triangle curved margin ends Doyle and Riedel, 1985b

a9/b5+8/c13+19/d19/e1/f4a+b/g7/h0,4/i4/j2,6/k8,14/m0.3-0.6/n>1.5/p0/q0,3,4/r0,1/s1/t4/z10,11 narrow triangle straight inbase Doyle et al., 1974; Doyle and Riedel, 1979a

a9/b±5+8/c19/d19/e1/f(4a+b)+9+12+14/g(4,6)+7/h0/i9/j10/k7+8/m0/n>2/p0/q0,2,10/ r0,1/s1,2/ t4/z2 triangle sigmoid rough Ramsey et al., 1976

a9/b5+8±(10,12)/c19/d19/e1/f(4a±b)±8±22/g3+7+8/h0,1,3,5/i3,4/j3,4/k5,8/m<0.3/n0.4-1.4/ p0/q0,6,7/r0,1/s3/t4/z0,4,5,7,8,9,10,11 cf. wide triangle Dunsworth et al., 1975; Doyle and Riedel, 1979a

a9/b8/c13+19/d13+19/e1/f(4a+b)+8,(9+13+22)/g7/h0/i3,4/j2/k8/m0.8/n>1.5/p0/q10/r1/s3/t4/z0 cf. straight triangle keeled edges Ramsey et al., 1976

a9/b8±(10,12)/c19/d19/e1/f4a+b/g3+7/h3/i3,4/j2,3/k8/m0.15-0.25/n≤1/p0/q9/r1/s3/t4/z0 cf. wide crescent Doyle et al., 1978

Undescribed triangular flanged tooth

a9/b7+8/c19/d19/e1/f0/g5+7/h1,5/i2/j2/k1/m0.33/n2.9/p0/q0,6,9/r0,1/s1/t4/z0,11 undescribed triangular flanged tooth, Form A

Cone teeth

a9/b1/c1/d1/e1/f4a+b/g3+8/h1,2,5/i2,3/j2,3/k7/m0/n~2/p0/q10/r1/s3/t2/z0 cf. triangle with parallel inline Doyle et al., 1974

a9/b1/c1/d1/e1/f(4a+b)+9+(12,13)+(14,15)/g1/h1,4,5/i3/j6/k0,1,5/m0/n1.4-1.7/p0/ q2,9,10/r0,1/s1,2,3/t2/z0 cf. small triangle long striations Dunsworth et al., 1975

a9/b1/c1/d1/e1/f9+12+14/g1/h2/i2,3,4/j2,3/k0,5/m0/n>2/p0/q6,10/r0,1/s1/t2/z0 cf. striated triangle Ramsey et al., 1976

a9/b1,5/c1/d1/e1/f1/g1/h0/i0,1/j0,1/k0,1/m0/n0/p0/q0/r0/s0/t2/z0,2/cc1,7/dd1,7/ee1/ff1/gg1,7/ hh0/jj4/kk3,4,5/mm0/nn0 cf. curved triangle, parallel-sided inline new subtype

a9/b1,5/c1/d1/e1/f1/g1/h4,5/i6/j3/k8+9/m0.4-0.7/n1.4-1.7/p0/q6,7,10/r1/s1,2/t2/z0 small pointed triangle Tway et al., 1985

a9/b1,5/c1/d1/e1/f1/g1,3,8/h0/i0/j0/k0/m0/n0/p0/q0/r0,1/s0/t2/z0,2/ cc1,7/dd1,7/ee1/ff0,1,3/gg1,7/ hh0/jj3/kk4/mm0/nn0 cf. curved triangle wide inline new subtype

a9/b1,5/c1/d1/e1/f1,4a+b/g1,3,6,8/h0,1,5/i3/j6,9/k0/m1.8-3.0/n1-2/p0/q0/r0/s1,2/t2/z0,2/ cc0,1,7/dd0,1,7/ee1/ff1/gg1,4,7,8/hh1.8-3.0/jj3/kk4/mm1.5-2.5/nn0.15-0.5 curved triangle wide inline new subtype

a9/b1,5/c1/d1/e1/f4a+b/g1/h0/i2,3/j2,6/k0/m0/n>1/p0/q0/r0/s1,2/t2/z2/cc1,7/dd1,7/ee1/ff1/gg1,7/hh>3/jj2,3,5/kk2,4,5/mm2.5-3.5/nn≤0.2 narrow tall triangle, cone inline new subtype

a9/b1,5/c1/d1/e1/f4a+b/g1/h0/i2,3/j2,6/k0,5,8/m0/n0/p0/q0/r0/s1,3/t2,3/z2/cc1,7/dd1,7/ee1/ff1/ gg4,7/hh>4/jj5/kk5/mm2/nn0.125 narrow tall triangle, inflated inline apex new subtype

a9/b1,5/c1/d1/e1/f4a+b/g1/h0/i2,3/j2,6/k0,8/m0/n~2/p0/q0/r0/s1,3/t2,3/z2/cc1,7/dd1,7/ee1/ff1/gg1,7/hh>4/jj3,5/kk4,5/mm1.8-2/nn0.20-0.25 narrow tall triangle, irregular threaded inline new subtype

a9/b1,5/c1/d1/e1/f4a+b/g1/h0/i6,7,9/j2,4,7,9/k8/m<0.1/n1.5-2.5/p0/q0/r0/s1,2/t2/z2/ cf. long triangle stepped margin Doyle et al., 1974; and cf. angled cone and bulbous base new subtype "shadowed high inline cone"

a9/b1,5/c1/d1/e1/f4a+b/g1/h0,1,5/i6,7/j2,3,9/k8,9/m0/n>2/p0/q0,6,7/r0,1/s1,3,4/t3/z0,2 shadowed curved blunt triangle new subtype

a9/b1,5/c1/d1/e1/f4a±b/g1/h0,1,5/i6,9/j6,9/k3/m0.05-0.25/n1.5-2/p0/q0,2/r0,1/s3/t2,3/z0,2 dome-top triangle bowed inline new subtype

a9/b1,5/c1/d1/e1/f(4a+b)+(8,9)+(11,12)+14/g1,3,8/h0,1,5/i2,3/j2,6/k0,1,7,11/m0/n1-1.5/p2.0-3.5/q0,2/r0,1/s2,3/t2/z0,2/cc1,7/dd1,7/ee1/ff2/gg1,4,8/hh2.5-3.5/jj3/kk4/mm1.5-4/nn0.1-0.3 curved triangle, striated inline new subtype

a9/b1,5/c1/d1/e1/f(4a+b)±10±11±14/g1±7/h0/i6,7/j3/k3,8/m0.5-0.6/n1.8-2.0/ p0/q0/r0/s3/t2/z2 cf. curved flared triangle Ramsey et al., 1976

a9/b5/c1/d1/e1/f4a+b/g1/h0/i2,3/j2,6/k0/m0/n<1.5/p0/q0/r0/s1,2,3/t2/z2/cc1,7/dd1,7/ee1/ff1,2/ gg4/hh>2/jj3/kk4/mm2-4/nn0.16-0.36 curved triangle, parallel-sided inline new subtype

a9/b5/c1/d1/e1/f4a+b/g1/h0/i2,6/j2,3/k0,1,12/m>2<2.5/n2-3/p0/q0/r0/s1,2/t3,2/z2/cc1/dd1/ ee1/ff1,2/gg1,4/hh2-2.5/jj4/kk3/mm~2/nn0.4-0.45 cf. narrow curved triangle Doyle et al., 1974; Doyle and Riedel, 1979a

a9/b5/c1/d1/e1/f±4a±b/g1/h0/i2,6/j2,3,6/k0/m0/n<2/p0/q0/r0/s0,1,3/t2/z3/cc1/dd1/ee1/ff1/gg3,7/hh~2/jj2,3,5/kk2,3/mm1.5-2.5/nn0.4-1.0 cf. short triangle stepped margin Doyle et al., 1974; Doyle and Riedel, 1979a

a9/b5/c1/d1/e1/f4a+b/g1/h0/i2,7,9/j2,3,9/k0,1,8/m0/n1.5-3/p0/q0/r0/s2/t2/z3/cc1,7/dd1,7/ee1/ ff1,2,3/gg4,7/hh1.5-3/jj4/kk3/mm1.5-2.5/nn0.2-1.0 cf. long triangle stepped margin Doyle et al., 1974; Doyle and Riedel, 1979a

a9/b5/c1/d1/e1/f4a+b/g1/h0/i6,9/j2,3,9/k8/m0/n<2.5/p0/q0/r0/s1,3/t2/z2/cc6,7/dd6,7/ee1/ff1/ gg1,4/hh>1.5/jj5/kk5/mm1-2/nn0.3-0.5 angled cone and bulbous base new subtype

a9/b5/c1/d1/e1/f4a+b/g1/h0,1,5/i2,3/j2/k0/m0/n~1/p0/q0/r0/s1,2/t2,3/z2/cc1/dd1/ee1/ff3/gg1,4,7/hh1.4-2.0/jj5/kk3/mm2.0-2.5/nn<0.18 cf. triangle small top Ramsey et al., 1976; Doyle and Riedel, 1979a

a9/b5/c1/d1/e1/f4b/g1/h0/i2,6/j2,3/k0/m0/n>1/p0/q0/r0/s0/t2/z2/cc1/dd1/ee1/ff1/gg1/hh>3/jj2,4/kk2,3/mm1.5/nn0,0.25-0.35 cf. triangular triangle Kozarek and Orr, 1980

Undescribed cone teeth

a9/b1/c1/d1/e1/f9+12+15+22/g1/h3/i3,10/j6,10/k7/m0/n>2.5/p0/q9,10/r1/s3/t2/z0 Undescribed cone tooth, Form A

a9/b1,5/c1/d1/e1/f1/g1,6,8/h0,1,5/i2,3/j2,6/k1/m0/n1,2.8/p0/q2,9/r0,1/s1/t2/z0,2/cc0,1/dd0,1/ ee0,1/ff0/gg0,3,7/hh1.8/jj3/kk4/mm2.9/nn0.19 Undescribed cone tooth, Form B

a9/b1,5/c1/d1/e1/f4a+b/g1/h0,1,5/i2/j2/k0/m0/n>1.5/p0/q0,2/r0,1/s1,2/t2/z0,2 Undescribed cone tooth, Form C

a9/b1,5/c1/d1/e1/f4a+b/g1/h0,1,5/i2,3,5/j6,8/k3+9/m0.25/n3.2/p0/q0,2/r0,1/s1,2/t2/z0,2 Undescribed cone tooth, Form D

a9/b1,5/c1/d1/e1/f4a+b/g1/h0,1,5/i2,5,3,9,10/j2,6,9,10/k0,1/m0/n>1,>3/p0/q0,2/r0,1/s3/t2/z0,2 Undescribed cone tooth, Form E

a9/b1,5/c1/d1/e1/f4a+b/g1/h0,1,5/i3/j6/k0/m0/n>1.5/p0/q0,2/r0,1/s1,2/t2/z0,2 Undescribed cone tooth, Form F

a9/b1,5/c1/d1/e1/f4a+b/g1/h0,1,5/i3,5/j6,8/k8,9/m0.13/n2.9/p0/q0,2/r0,1/s1,3/t2/z0,2 Undescribed cone tooth, Form G

a9/b1,5/c1/d1/e1/f4a+b/g1/h0,1,5/i3,9,10/j6,9,10/k3,8,9/m0/n2-4/p0/q0,2/r0,1/s1,2/t2/z0,2 Undescribed cone tooth, Form H

a9/b1,5/c1/d1/e1/f4a+b/g1/h0,4/i4,9,10/j6,10/k0/m0/n>1.5/p0/q0,2/r0,1/s1,2/t2/z0,2 Undescribed cone tooth, Form I

a9/b1,5/c1/d1/e1/f(4a+b)+8/g1/h0,1,5/i2,9,10/j2,9,10/k7/m0/n≥1/p0/q0,2/r0,1/s1/t2/z0,2 Undescribed cone tooth, Form J

a9/b1,5/c1/d1/e1/f(4a+b)+8/g1/h1,5/i9,10/j9,10/k0,1/m0/n>2/p0/q0,2/r0,1/s3/t2/z0,2 Undescribed cone tooth, Form K

a9/b1,5/c1/d1/e1/f(4a+b)+9+11+(14,15)/g1/h0,4/i5/j8/k8,9/m0/n>1,>2/p0/q0,2/r0,1/s1/t2/z0,2 Undescribed cone tooth, Form L

a9/b5/c1/d1/e1/f4a+b/g1/h0,1,5/i5/j8/k5,8,9/m0.13/n2.5/p0/q0,2/r0,1/s3/t2/z2 Undescribed cone tooth, Form M

APPENDIX 1.6.1

Type a9/b1,(±2±3±5±7±8±9±10±11±12)

Outline approximately triangular with a straight or curved axis. Neither margin has prominent flexure. A transverse line may separate crown and base. [2, 32]

c. Modifications of the "first margin" above the transverse line if one is present and meets the margin. "First margin" is identified as possessing one of the following characters (in the priority listed):

- shallow reflexed angle or curve
- single triangular projection
- concave margin
- markedly shorter than the other margin
- margin which departs most from a straight line [2, 8]

0. indeterminate [32]

1. none of the following [2, 8]
2. (not used)
3. more than one triangular projection [8]
4. single triangular projection [2, 8]

5. shallow reflexed angle (a reflexed departure from a straight line, less pronounced than a prominent flexure) or curve in uppermost one-fifth [2, 8]

6. shallow reflexed angle or curve in second one-fifth [2, 8]

7. shallow reflexed angle or curve in middle one-fifth [2, 8]

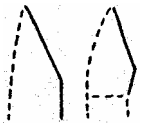
8. shallow reflexed angle or curve in fourth one-fifth [2, 8]

9. shallow reflexed angle or curve in fifth one-fifth [2, 8]

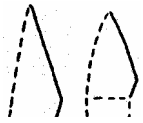
10. shallow simple outward angle (not reflexed) in uppermost quarter [2, 8]

11. shallow simple outward angle (not reflexed) in second quarter [2, 8]

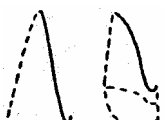
12. shallow simple outward angle (not reflexed) in third quarter [2, 8]



13. shallow simple outward angle (not reflexed) in fourth quarter [2, 8]

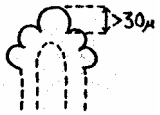


14. terminal part of margin “hooked” upward [2, 8]

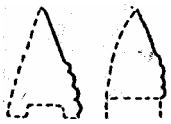


15. crenate, saw-toothed, or some other incised pattern on upper half of margin. No lateral projection longer than 0.3 mm. [2, 4, 8]

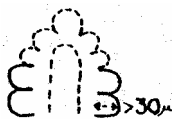
16. crenate, saw-toothed, or some other incised pattern on upper half of margin. At least one lateral projection longer than 0.3 mm. [4, 8]



17. crenate, saw-toothed, or some other incised pattern on lower half of margin. No lateral projection longer than 0.3 mm. [2, 4, 8]



18. crenate, saw-toothed, or some other incised pattern on lower half of margin. At least one lateral projection longer than 0.3 mm. [4, 8]



19. flanged occlusal crest or longitudinal blade-like or wing-like projection [5, 8, 9, 19, 32]

20. shallow simple inward angle in middle one third (not reflexed) [17]

21. margin straight in upper half and convex in lower half with a protuberance (e.g. Lady sandal) [27]

d. Modifications of second margin above transverse line if one is present and meets the margin (as in "c" above) [2, 8]

e. Features restricted to within the inline (above the transverse line if present) [2, 8]

0. indeterminate [32]

1. none of the following [2, 8]

2. branching canals [2, 8]

f. Features between apical inline and outline (or transverse line or base of outline if inline not present) and margins (above transverse line if present) [2, 8]

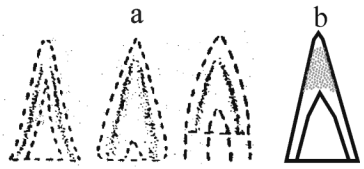
0. indeterminate [32]

1. none of the following [2, 8]

2. (not used)

3. longitudinal line from apex of outline, or near apex, toward apex of inline [2, 5, 8]

4. 4a= lateral shadow (a dark lateral zone separated from the margin by a narrow light zone); 4b=apical shadow (shadow in apical region) [2, 8, 32]



5. area between the inline and margins at least one third wider on one side than on the other [2, 8]

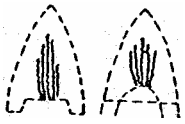
6. (not used)

7. (not used)

8. striations originating from inline (or, if inline not present, from base or transverse line). Location and extent of striations not recorded. [8]

9. striations originating from more than the central half of width of inline (or if inline not present, more than the central half of width of base or transverse line) [7, 8]

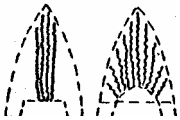
10. striations originating from central half or less than the central half of width of inline (or if inline not present, equal to or less than central half of width of base or transverse line) [7, 8]



11. striations restricted to lower half of area within outline [7, 8]

12. striations extending into upper half of outline, but not upper quarter [7, 8]

13. striations extending into upper quarter of outline [4, 7, 8]



14. majority of striations departing less than 45° from longitudinal axis [7, 8]

15. majority of striations departing more than 45° from longitudinal axis [7, 8]

16. simply or complexly curved line not parallel to inline terminating at both sides of the base or transverse line [2, 8]

17. line parallel to outline [8]

18. simply or complexly curved line terminating at both sides of the margin [2, 8]

19. two or more straight or curved lines terminating at both sides of the margin [8]

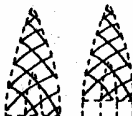
20. ornamented by semi-regularly spaced punctuate [8]

21. canals extending out from the inline [8]

22. irregular, dark, longitudinal markings, sufficient to darken image [17]

g. Features within outline, but not restricted to zone between inline and outline (above transverse line if present) [2, 8]

0. indeterminate [32]
1. none of the following [2, 8]



2. ornamented by two oblique intersecting sets of parallel lines [2, 8]
3. stippling or pitting [2, 8]

4. prominent and irregular longitudinal striations, sufficient to darken image [8]

5. a single prominent longitudinal line [8]

6. longitudinal, parallel to subparallel lines or ridges [24]

7. lateral occlusal crest, flange, or cutting edge at both margins [32]

8. short, irregular, slightly raised striations [32]

h. Relative lengths of margins (only if transverse line is not present or it does not intersect the margins) [2, 8]

0. indeterminate [8]

1. no marked difference [2, 32]

2. first margin markedly (at least 15%) longer [2, 8]

3. one margin markedly (at least 15%) longer [2, 8]

4. one margin 5-15% longer [4, 8]

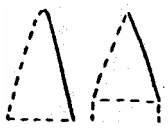
5. less than 5% difference between first and second margins [4, 8]

i. Gross shape of first margin (above transverse line if present and intersects the margin), excluding modifications of margin and details of its junction with apex and base of outline [2, 8]

0. indeterminate [32]

1. none of the following [2, 8]

2. straight [2, 8]



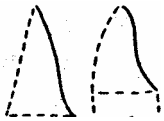
3. convex, with curvature evenly distributed [2, 8]

4. convex, with most of curvature basally [2, 8]

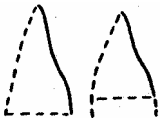
5. convex, with most of curvature apically [2, 8]

6. concave, with curvature evenly distributed [2, 8]

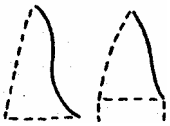
7. concave, with most of curvature basally [2, 8]



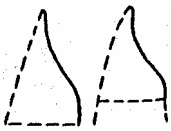
8. concave, with most of curvature apically [2, 8]



9. sigmoid (margin of tooth with upper part convex outward) [2, 8]



10. reverse sigmoid (margin of tooth with upper part concave outward) [4, 8]



j. Gross shape of the second margin (above transverse line if present and intersects the margin), excluding modifications of margin and details of its junction with apex and base of outline (as in "i" above) [2, 8]

k. Shape of the inline (above the transverse line if present) [2, 8]

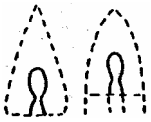
0. none [8]
1. indeterminate [32]
2. none of the following [2]

3. approximately parallel to outline but with sides bowed-in, curvature evenly distributed [2, 8]

4. approximately parallel to outline but markedly acuminate (with sides of inline below apical portion curved with convexity outward) [2, 8, 17]

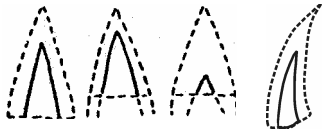
5. arcuate [2, 8]

6. both sides of inline forming a constriction [2, 8]



7. markedly narrower than outline, parallel-sided [2, 8]

8. approximately same shape as outline, but not with sides bowed-in, or markedly acuminate, or closely approaching outline at base [2, 4, 8, 32]



9. approximately same shape as outline, but not with sides bowed-in or markedly acuminate, but with margins closely approaching the outline at the base [4, 8, 32]

10. apical part of inline dendritically branched [7, 8]

11. apical part of inline not pointed, nor arcuate, but almost straight (transverse to the axis of the tooth) [7, 8]

12. apical part of inline drawn-out, thread-like [8]

13. one or more sinuous curves on both sides of inline [17]

14. markedly acuminate with sides of inline below apical portion straight and divergent [17]

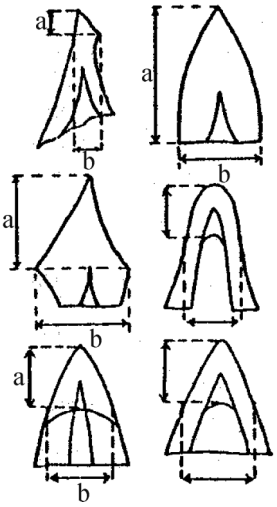
15. club-shaped [27]

m. Perpendicular length from apex or outline to apex of inline divided by length from apex of outline to base of inline (or to base of outline if inline not present) = a/b. If transverse line is present, measurements are to point on transverse line closest to apex. [2, 8, 32]

0. indeterminate [8]

Recorded as numbers [8]

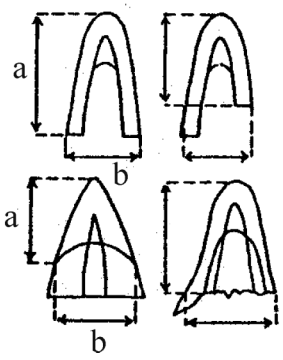
n. Perpendicular length from apex of outline to level of maximum width divided by maximum width = a/b. If base is reentrant (directed inward), length is measured from apex of outline to nearest point on reentrant (even if wider further below reentrant level). If transverse line is present, measurements are to point on transverse line closest to apex. [2, 8, 32]



0. indeterminate [2, 8]

Recorded as numbers [2, 8]

p. Perpendicular length from apex of outline to lowest level both margins are intact divided by the width at that level = a/b. If the transverse line which meets the margin is present, the measurement is made at the level farthest from the apex at which the transverse line meets the margin. [8, 32]



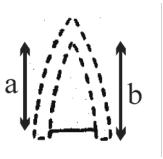
0. indeterminate, inapplicable, or not recorded since this ratio is identical with that of "n" [8]

Recorded as numbers [8]

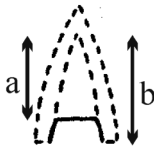
q. Character of base within inline, or if inline is not present then of base itself. Inapplicable if transverse line is present. [2, 8]

0. indeterminate or inapplicable because transverse line is present [8]
1. none of the following [2, 8]
2. an approximately straight line at same level as margin ends [2, 8]

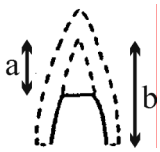
3. an approximately straight line above end of at least one margin; ratio of inline height divided by height from where both margins are basally intact to inline apex; a/b = greater than 0.85 [2, 8, 32]



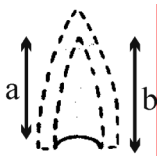
4. an approximately straight line above end of at least one margin; ratio of inline height divided by height from where both margins are basally intact to inline apex; a/b = 0.85-0.75 [2, 8, 32]



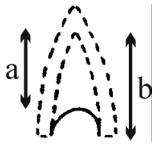
5. an approximately straight line above end of at least one margin; ratio of inline height divided by height from where both margins are basally intact to inline apex; a/b = less than 0.75 [2, 8, 32]



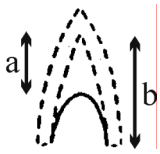
6. a curved line concave downward; ratio of inline height divided by height from where both margins are basally intact to inline apex; a/b = greater than 0.85 [2, 8, 32]



7. a curved line concave downward; ratio of inline height divided by height from where both margins are basally intact to inline apex; a/b = 0.85-0.75 [2, 8, 32]



8. a curved line concave downward; ratio of inline height divided by height from where both margins are basally intact to inline apex; a/b = less than 0.75 [2, 8, 32]



9. Irregularly jagged, as if broken. No downward projecting lobe as in q10. [5, 8]

10. Irregularly jagged, as if broken, with one or more lobes extend below lower limit of lateral margin. [5, 8]

r. Character of base between inline and outline. Inapplicable if transverse line is present. [2, 8]

0. indeterminate or inapplicable because transverse line is present [8]
1. none of the following [2, 8]

2. one base a straight line, other pointed [2, 8]

3. both bases pointed [2, 8]

4. both bases curving inward [2, 8]

5. both bases smoothly curved [2, 8]

s. Apex acuteness [2, 8, 9, 19]

0. indeterminate [9, 19]

1. none of the following or neither sharp nor blunt [17]

2. sharp [2, 8, 9, 19]

3. blunt [2, 8, 9, 19]

4. truncate [8]

5. asymmetrical [8]

t. General outline in apical view or cross-section [5, 8, 32]

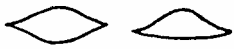
0. indeterminate [5, 8]

1. none of the following

2. approximately circular [5, 8, 19]

3. not circular but obtuse laterally [5, 8]

4. not circular but elliptical and acute laterally [5, 8, 32]



5. triangular [19]

z. Characters of the transverse line [2, 8]

0. absent or indeterminate [8, 32]

1. none of the following [2, 8]

2. straight line terminating at margins [2, 8]

3. straight or curved line extending beyond one or both margins of that part of outline immediately above transverse line [2, 8]

4. simply curved line terminating at sides of inline [2, 8]

5. simply curved or straight line terminating at sides of inline [2, 8]

6. simply curved line intersecting sides of inline and continuing into area between inline and outline [2, 8]

7. complexly curved line intersecting the margins at the same level [2, 8]

8. complexly curved line intersecting margins at different levels [2, 8]

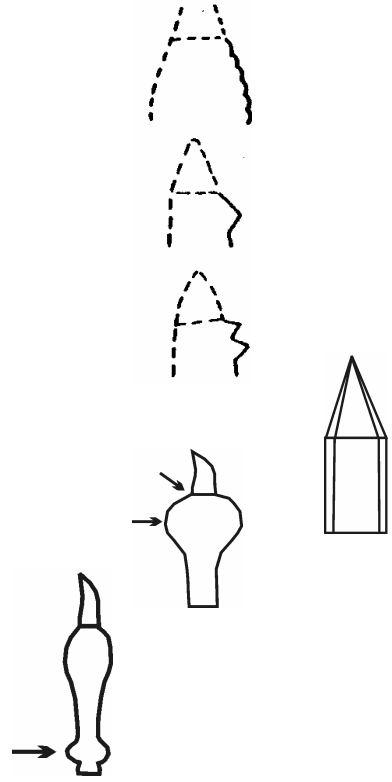
9. simply curved line intersecting margins at different levels (length of margins above transverse line differ by at least 5%) [4, 8]

10. flexed line terminating at margins at different levels [7, 8]

11. flexed line terminating at margins at same level [8]

cc. Modifications of first margin below transverse line (if transverse line is present and meets margins) [2, 8]

0. indeterminate or inapplicable [8]
1. none of the following [2, 8]
2. crenate, saw-toothed or some other incised pattern [2, 8]
3. single triangular projection [2, 8]
4. two or more triangular projections
5. flanged occlusal crest or cutting edge [32]
6. rounded projection, "bulbous" and with stepped margin [32]
7. basal rim [32]



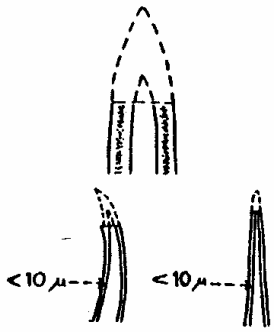
dd. Modifications of second margin below transverse line (as in "cc" above) [2, 8]

ee. Features restricted to within inline below transverse line (if transverse line is present) [2, 8]

0. indeterminate or inapplicable [8]
1. none of the following [2, 8]
2. branching canals [2, 8]

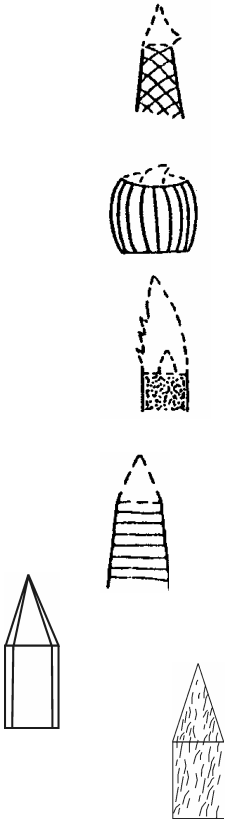
ff. Features between inline and outline below transverse line (if transverse line is present and meets margins) [4, 8]

0. indeterminate or inapplicable [8]
1. none of the following [4, 8]
2. "lateral shadow [4, 8]
3. distance between inline and outline is less than 0.10 mm (10 microns) at its maximum [4, 8]

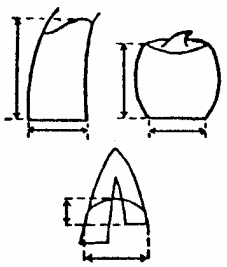


gg. Features within outline (below transverse line if present) and not restricted to region between inline and outline [2, 8]

0. indeterminate or inapplicable [8]
1. none of the following [2, 8]
2. ornamented with two oblique intersecting sets of parallel lines [2, 8]
3. vertical striations, lines, or ridges which are approximately parallel to margins [2, 8]
4. stippling or rough texture [4, 8, 32]
5. ornamented with lines or ridges which meet margins and approximately parallel to transverse line [8]
6. margin flanged occlusal crest or cutting edges [32]
7. irregular lines or ridges [32]



hh. If transverse line is present, perpendicular length from a point on transverse line closest to apex divided by width of base at which both margins are intact = a/b [8, 32]



0. indeterminate or inapplicable [8]

Recorded as numbers [8]

jj. Gross shape of first margin below transverse line (if present), excluding details of its junction with transverse line [2, 8]

0. indeterminate or inapplicable [8]
1. none of the following [2, 8]

2. straight [2, 8]

3. convex [2, 8]

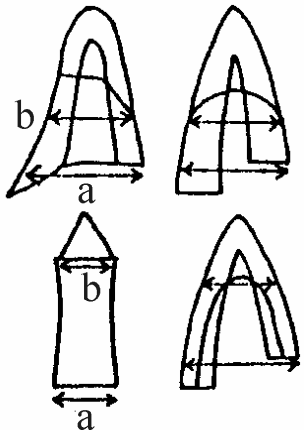
4. concave [2, 8]

5. sigmoid [2, 8]

6. reverse sigmoid [8]

kk. Gross shape of second margin below transverse line (if present), excluding details of its junction with transverse line (as in "jj" above) [2, 8]

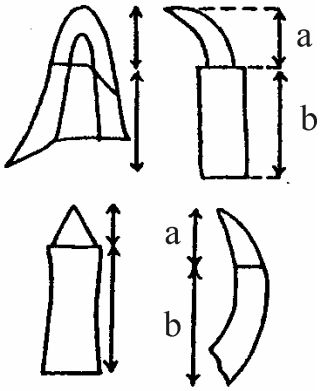
mm. If transverse line is present and its meets margins, width as far down ichthyolith which both margins are intact divided by width at point of intersection (farthest from apex) of margins and transverse line = a/b. If transverse line does not meet margins, division is distance between points of intersection of transverse line and inline. [8, 32]



0. indeterminate or inapplicable [8]

Recorded as numbers [8]

nn. If transverse line is present, perpendicular length from apex of outline to a point on transverse line closest to apex divided by length from same point on transverse line to lowest level of longer margin = a/b. [8, 32]



0. indeterminate or inapplicable [8]

Recorded as numbers [8]