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Title	Functional transformation series and the evolutionary origin of novel forms: evidence from a remarkable termite defensive organ
Author(s)	Kaji, Tomonari; Keiler, Jonas; Bourguignon, Thomas et al.
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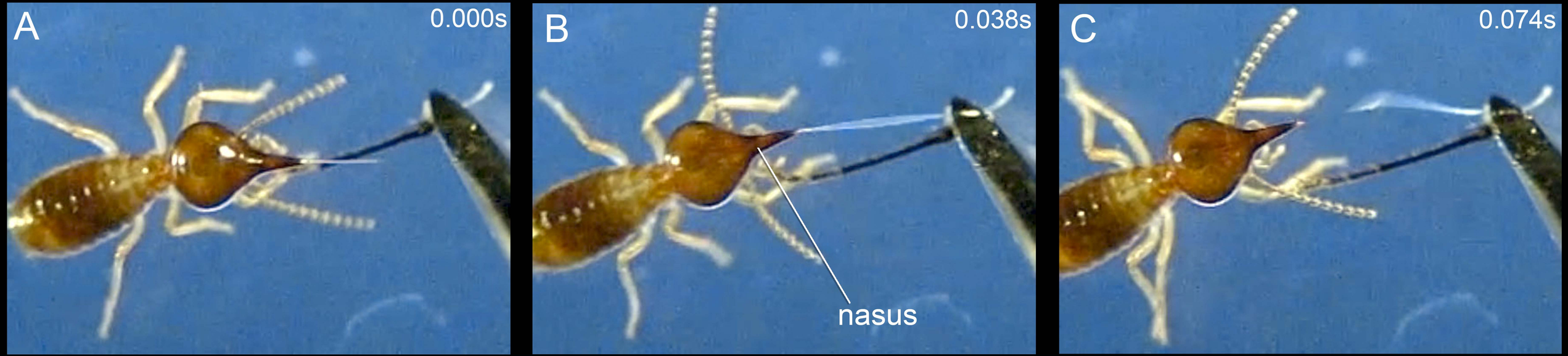
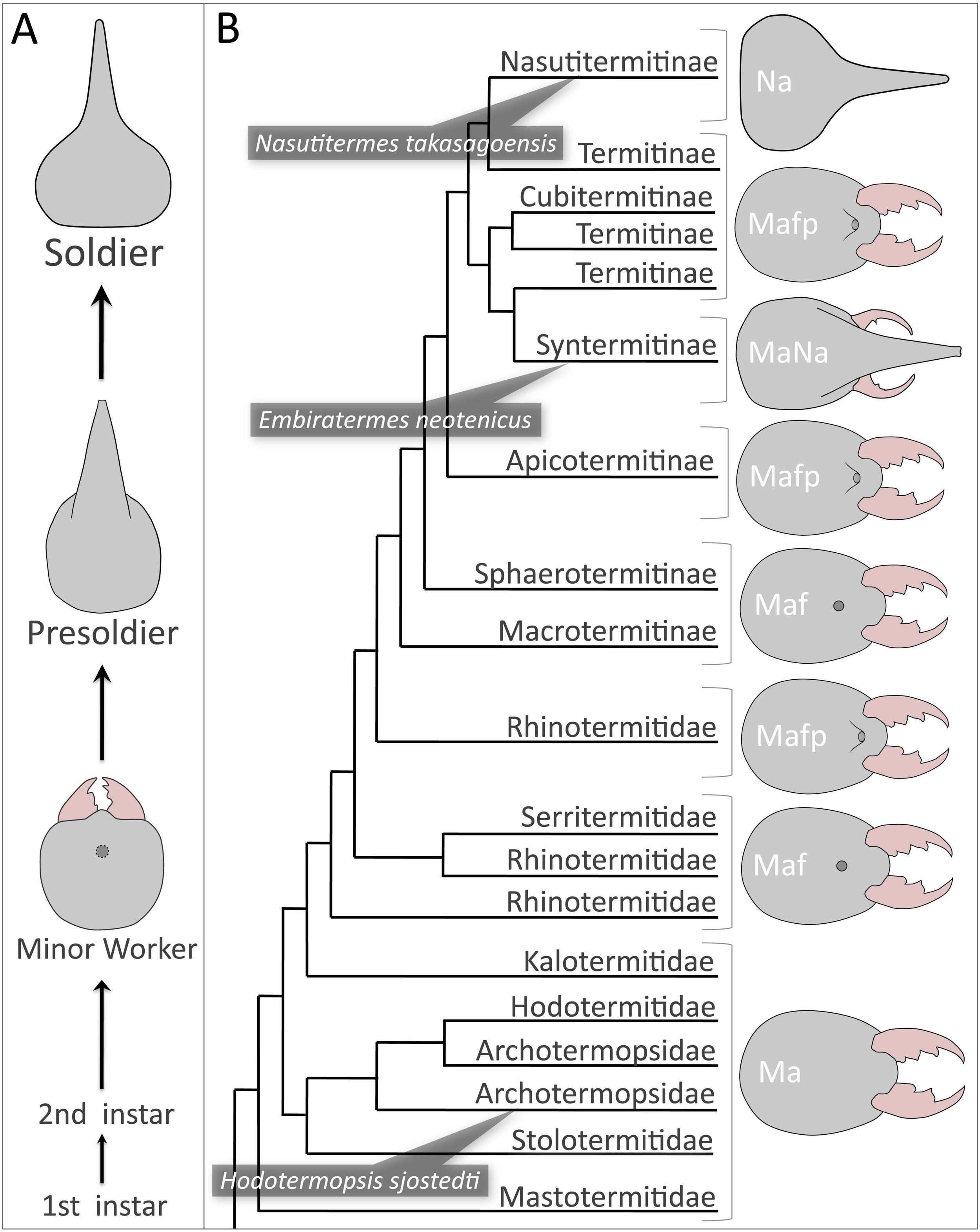
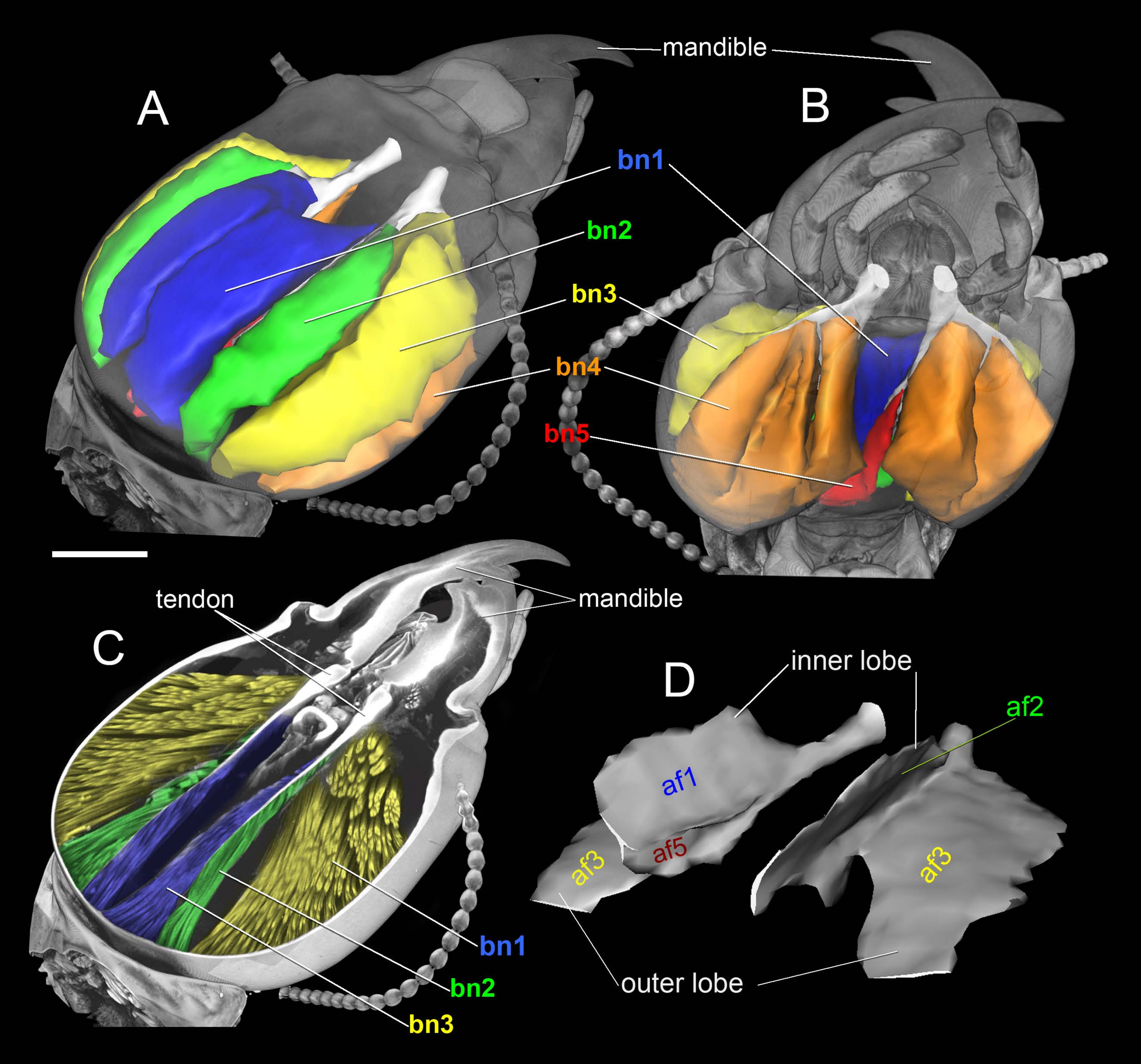
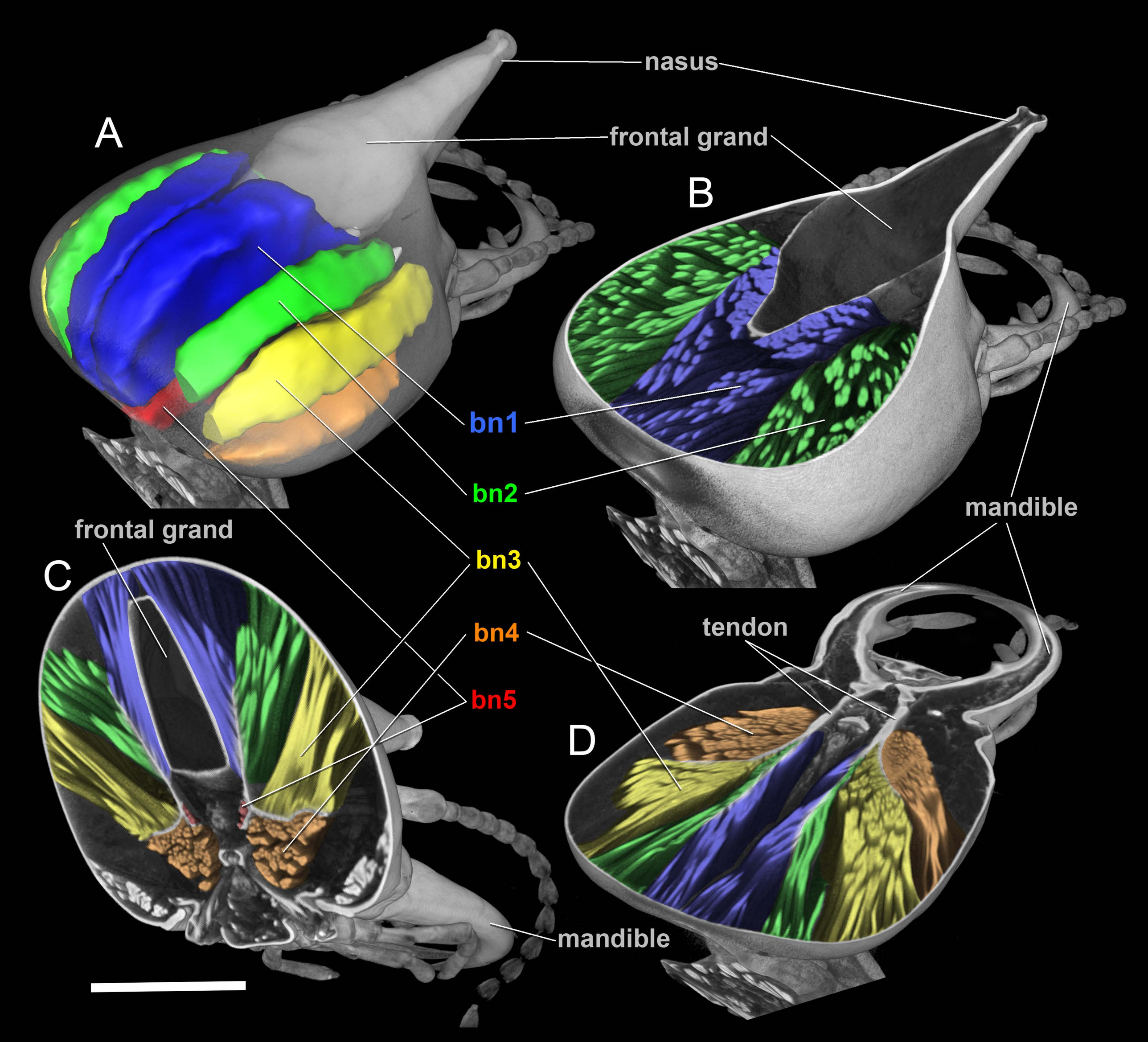
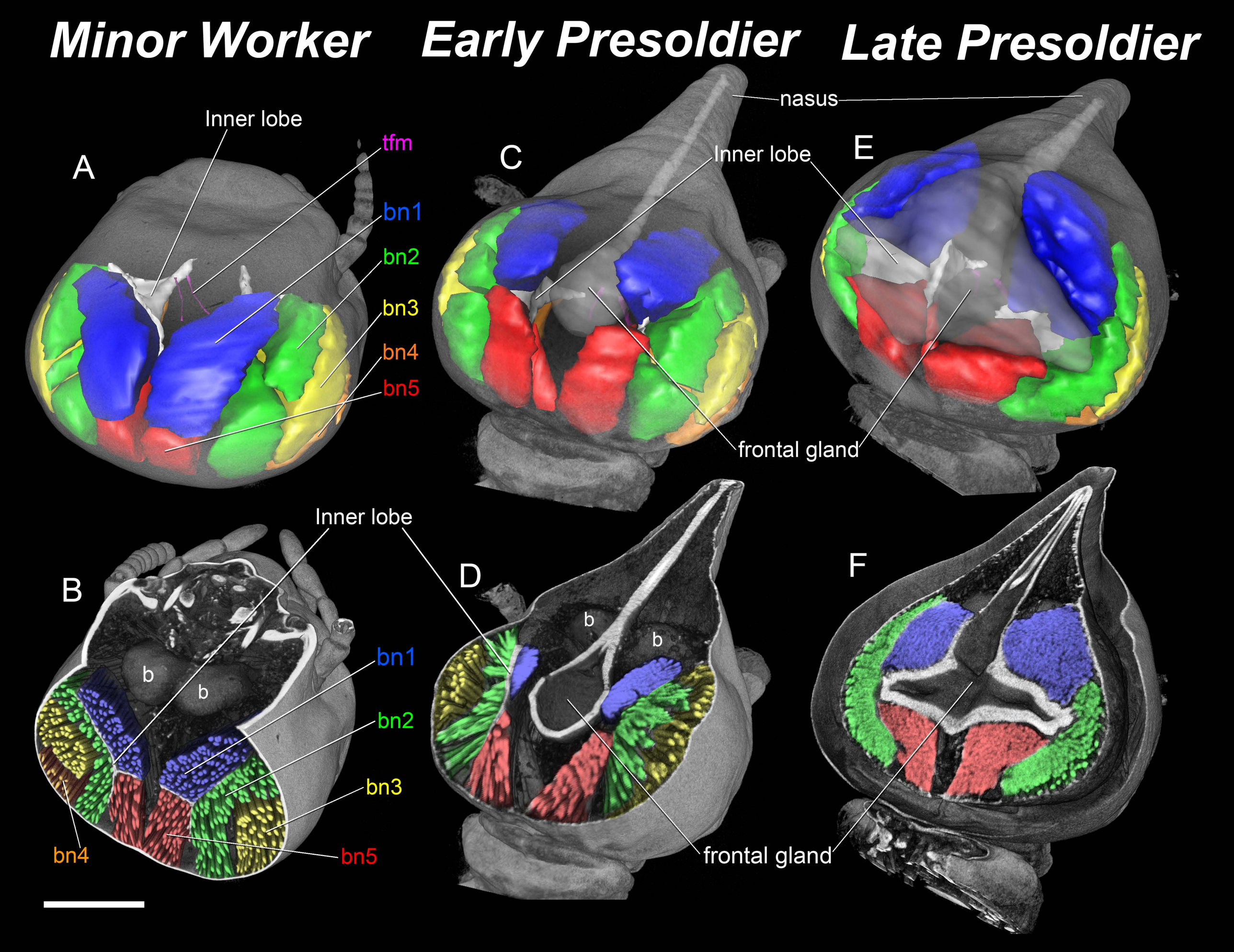
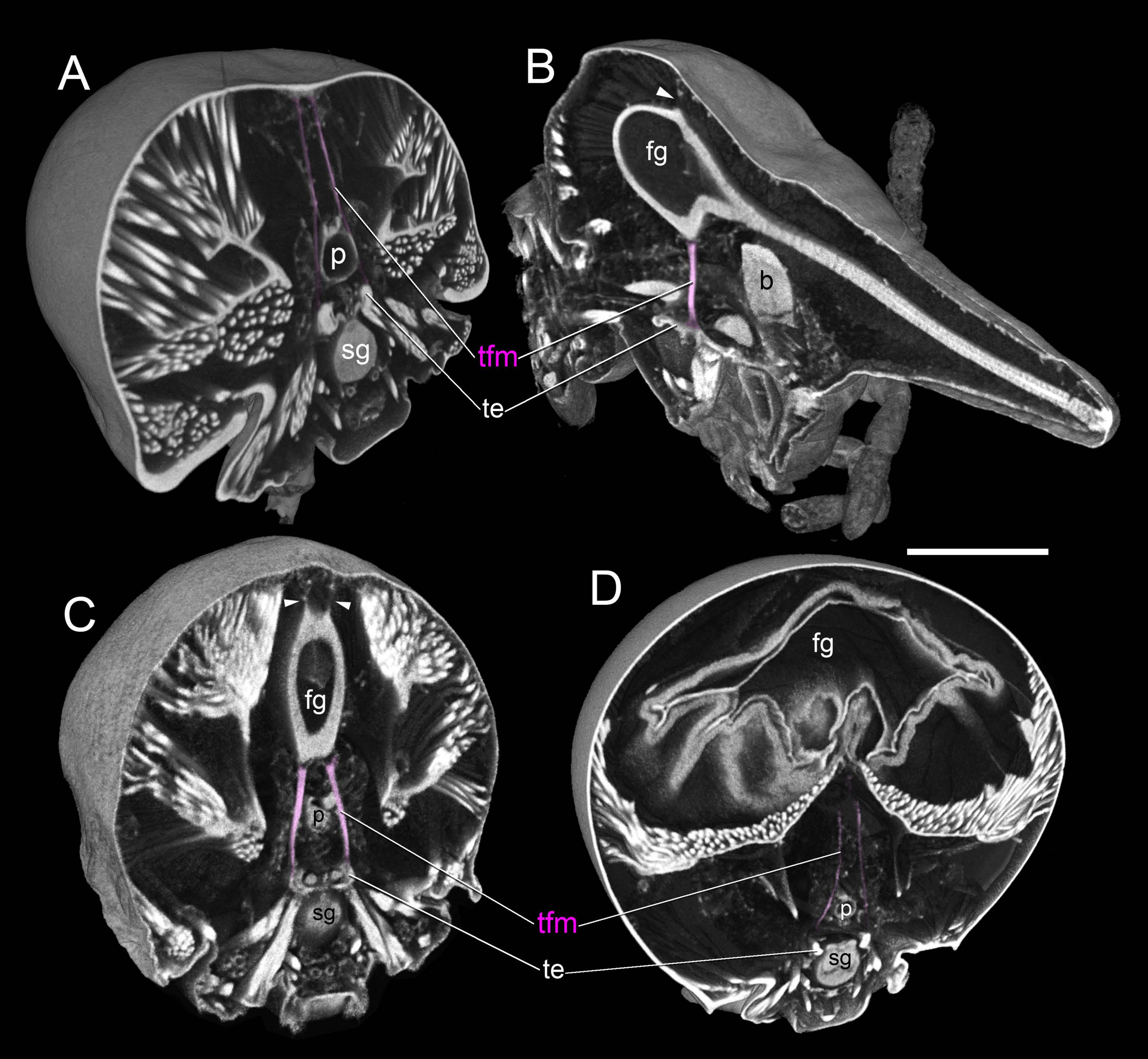

A
0.000s
B
0.038s
nasus
C
0.074s

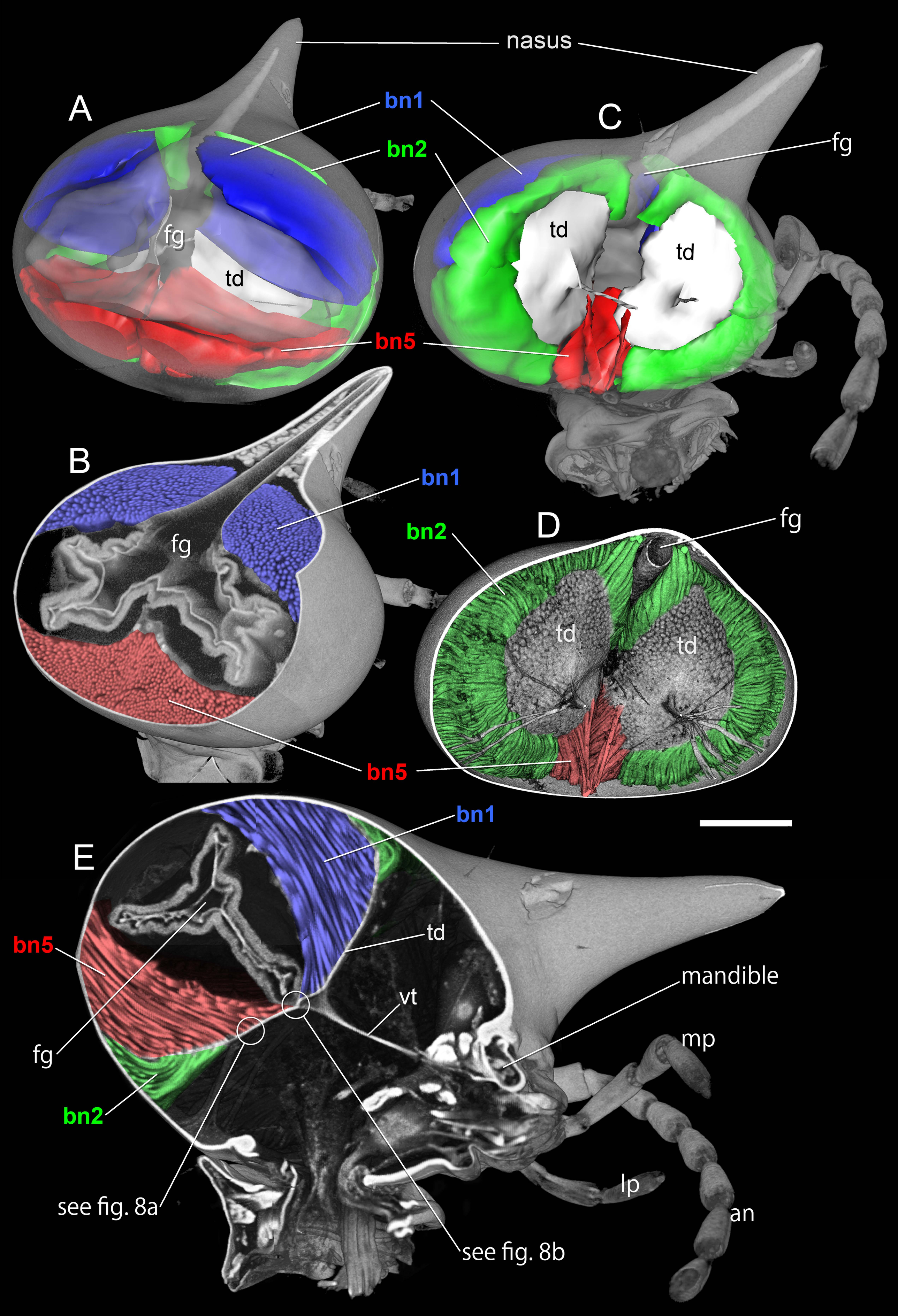

A
Soldier
Presoldier
Minor Worker
2nd instar
1st instar
B
Nasutitermitinae
Nasutitermes takasagoensis
Termitinae
Cubitermitinae
Termitinae
Termitinae
Syntermitinae
Embiratermes neotenicus
Apicotermitinae
Sphaerotermitinae
Macrotermitinae
Rhinotermitidae
Serritermitidae
Rhinotermitidae
Rhinotermitidae
Kalotermitidae
Hodotermitidae
Archotermopsidae
Archotermopsidae
Stolotermitidae
Hodotermopsis sjostedti
Mastotermitidae
Na
Mafp
MaNa
Mafp
Maf
Mafp
Maf
Ma

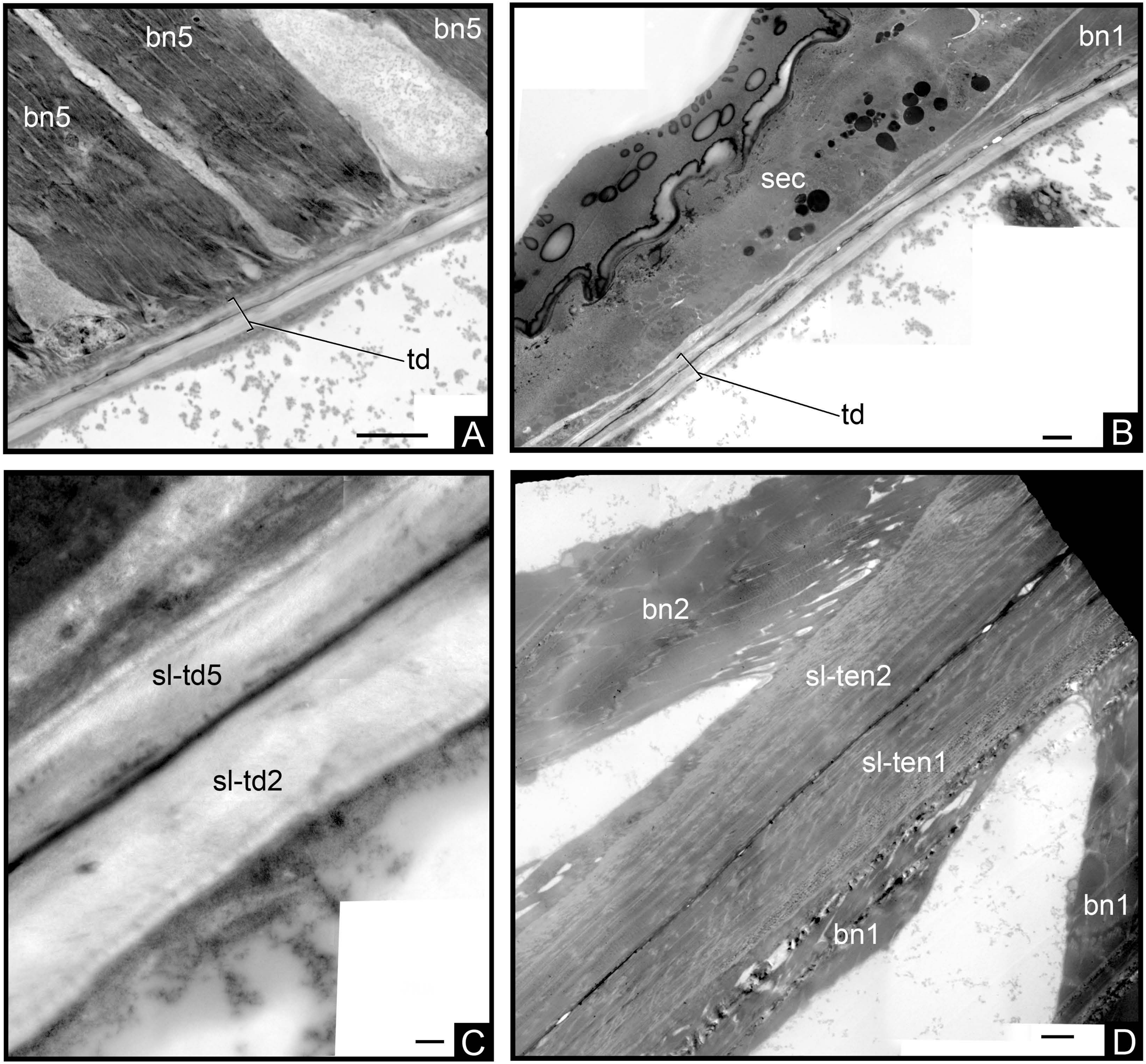

A
B
C
D
mandible
bn1
bn2
bn3
bn4
bn5
tendon
mandible
bn1
bn2
bn3
inner lobe
af2
af1
af3
af5
af3
outer lobe

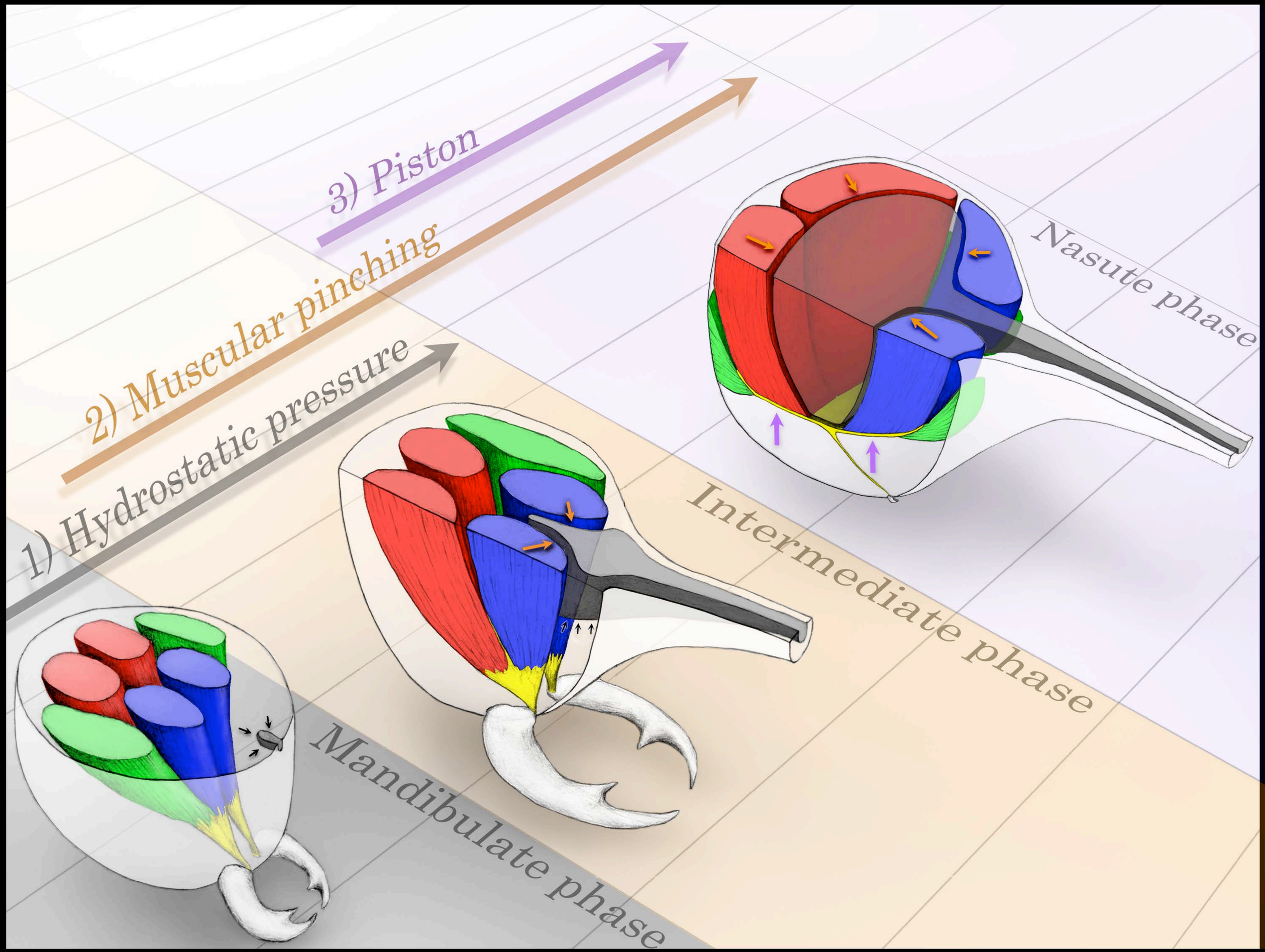

A
B
C
D
nasus
frontal grand
bn1
bn2
bn3
bn4
bn5
frontal grand
mandible
tendon
mandible


Minor Worker
Early Presoldier
Late Presoldier
A
Inner lobe
tfm
bn1
bn2
bn3
bn4
bn5
C
nasus
Inner lobe
frontal gland
E
B
Inner lobe
b
b
bn1
bn2
bn3
bn4
bn5
D
b
b
frontal gland
F


A
B
C
D
p
sg
fg
b
tfm
te


A
nasus
bn1
bn2
fg
td
bn5
C
fg
td
td
bn5
B
bn1
fg
bn5
D
bn2
fg
td
td
bn5
E
bn1
td
bn5
vt
mandible
fg
mp
bn2
lp
see fig. 8a
an
see fig. 8b


bn5
bn5
bn5
td
A
bn1
sec
td
B
sl-td5
sl-td2
C
bn2
sl-ten2
sl-ten1
bn1
bn1
D


3) Piston
2) Muscular pinching
1) Hydrostatic pressure
Nasute phase
Intermediate phase
Mandibulate phase