Supplementary Table 1: Variability of the occipito-atlanto-axial complex in major squamate groups. In total we screened 110 digimorph (Humphries, 2004) microCT datasets for the presence and the morphology of a functional odontoid process (an odontoid process that acts as pivot in turning the head). By looking at sagittal and horizontal microCT slices we classified species into five groups according to the degree of overlap between the odontoid process and the basioccipital (1 (red) = no overlap, no functional odontoid process; 2-4 intermediate forms of overlap and odontoid process morphology; 5 (green) = perfect overlap, elongated odontoid process, see also Figure 5). Number of species analysed: Iguania n=35; Gekkota n=8; Lacertoidea n=8; Scincoidea n=10; Amphisbaenia n=6; Serpentes n=32; Anguimorpha n=11. Data on Rhynchocephalia was taken from Jones et al. (2009).

Amphisbaenia (n=6)			
species	data source	occipito-axial joint	
Amphisbaena fuliginosa	Digimorph	1	
Trogonophis wiegmanni	Digimorph	1	
Bipes biporus	Digimorph	2	
Bipes canaliculatus	Digimorph	2	
Rhineura floridana	Digimorph	2	
Diplometopon zarudnyi	Digimorph	3	

Anguimorpha (n=11)			
species	data source	occipito-axial joint	
Heloderma horridum	Digimorph	1	
Heloderma suspectum	Digimorph	1	
Pseudopus apodus	Digimorph	1	
Shinisaurus crocodilurus	Digimorph	1	
Lanthanotus borneensis	Digimorph	2	
Varanus exanthematicus	Digimorph	2	
Xenosaurus grandis	Digimorph	2	
Celestus enneagrammus	Digimorph	3	
Varanus acanthurus	Digimorph	3	
Elgaria multicarinata	Digimorph	4	

Gekkota (n=8)			
species	data source	occipito-axial joint	
Eublepharis macularius	Digimorph	3	
Coleonyx variegatus	Digimorph	4	
Gekko gecko	Digimorph	4	
Rhacodactylus auriculatus	Digimorph	4	
Delma borea	Digimorph	5	
Gonatodes albogularis	Digimorph	5	
Lialis burtonis	Digimorph	5	
Phelsuma lineata	Digimorph	5	

Iguania (n=35)			
species	data source	occipito-axial joint	
Brookesia brygooi	Digimorph	1	
Chamaeleo laevigatus	Digimorph	1	
Anolis carolinensis	Digimorph	3	
Leiosaurus catamarcensis	Digimorph	3	
Physignathus cocincinus	Digimorph	3	
Plica plica	Digimorph	3	
Zapsosaurus sceliphros †	Digimorph	3	
Brachylophus fasciatus	Digimorph	4	
Crotaphytus collaris	Digimorph	4	
Enyalioides laticeps	Digimorph	4	
Gambelia wislizenii	Digimorph	4	
Isodontosaurus gracilis †	Digimorph	4	
Oplurus cyclurus	Digimorph	4	
Phrynosoma platyrhinos	Digimorph	4	
Pogona vitticeps	Digimorph	4	
Polychrus marmoratus	Digimorph	4	
Pristidactylus torquatus	Digimorph	4	
Uranoscodon superciliosus	Digimorph	4	
Uromastyx aegyptius	Digimorph	4	
Urostrophus vautieri	Digimorph	4	
Agama agama	Digimorph	5	
Basiliscus basiliscus	Digimorph	5	
Calotes emma	Digimorph	5	
Chalarodon madagascariensis	Digimorph	5	
Corytophanes cristatus	Digimorph	5	
Dipsosaurus dorsalis	Digimorph	5	
Leiocephalus barahonensis	Digimorph	5	
Leiolepis belliana	Digimorph	5	
Liolaemus bellii	Digimorph	5	
Petrosaurus mearnsi	Digimorph	5	
Phymaturus palluma	Digimorph	5	
Sceloporus variabilis	Digimorph	5	
Stenocercus guentheri	Digimorph	5	
Uma scoparia	Digimorph	5	
Uta stansburiana	Digimorph	5	

Lacertoidea (n=8)			
species	data source	occipito-axial joint	
Tupinambis teguixin	Digimorph	1	
Lacerta viridis	Digimorph	2	
Callopistes maculatus	Digimorph	4	
Takydromus ocellatus	Digimorph	4	
Teius teyou	Digimorph	4	
Aspidoscelis tigris	Digimorph	5	
Colobosaura modesta	Digimorph	5	
Pholidobolus montium	Digimorph	5	

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Rhynchocephalia (n=1)		
species	data source	occipito-axial joint
Sphenodon punctatus	Jones et al. (2009)	1

Scincoidea (n=10)		
species	data source	occipito-axial joint
Lepidophyma flavimaculatum	Digimorph	2
Scincus scincus	Digimorph	2
Amphiglossus splendidus	Digimorph	3
Brachymeles gracilis	Digimorph	3
Cordylosaurus subtesselatus	Digimorph	4
Cordylus mossambicus	Digimorph	4
Tiliqua scincoides	Digimorph	4
Zonosaurus ornatus	Digimorph	4
Eugongylus rufescens	Digimorph	5
Sphenomorphus solomonis	Digimorph	5

Serpentes (n=32)		
species	data source	occipito-axial joint
Anilius scytale	Digimorph	1
Anomochilus leonardi	Digimorph	1
Aspidites melanocephalus	Digimorph	1
Boa constrictor	Digimorph	1
Calabaria reinhardtii	Digimorph	1
Casarea dussumieri	Digimorph	1
Cylindrophis ruffus	Digimorph	1
Eryx colubrinus	Digimorph	1
Lichanura trivirgata	Digimorph	1
Loxocemus bicolor	Digimorph	1
Tropidophis haetianus	Digimorph	1
Ungaliophis continentalis	Digimorph	1
Xenopeltis unicolor	Digimorph	1
Causus rhombeatus	Digimorph	2
Leptotyphlops dulcis	Digimorph	2
Naja naja	Digimorph	2
Natrix natrix	Digimorph	2
Python molurus	Digimorph	2
Coluber constrictor	Digimorph	3
Lachesis muta	Digimorph	3
Lampropeltis getula	Digimorph	3
Liotyphlops albirostris	Digimorph	3
Typhlops jamaicensis	Digimorph	3
Agkistrodon contortrix	Digimorph	4
Amphiesma stolata	Digimorph	4
Bothrops asper	Digimorph	4
Laticauda colubrina	Digimorph	4
Lycophidion capense	Digimorph	4
Micrurus fulvius	Digimorph	4
Thamnophis marcianus	Digimorph	4
Typhlophis squamosus	Digimorph	4
Xenochrophis piscator	Digimorph	4