

S2. Photographs of sampled bones



A, Humerus and B, Femur of *Paraplocodus broilli* (PIMUZ T5845) from the Anisian/Ladinian (Besano Formation, Grenzbitumenhorizont) of the locality of Monte San Giorgio (Switzerland/Italy). C, Humerus (PIMUZ A/III 1476) and D, Femur (PIMUZ A/III 0735) of *Psephoderma alpinum* from the Rhaetian (Kössener Formation) of Tinzenhorn (Switzerland). E, Humerus of *Henodus cheylops* (GPIT spec. no. 1) from the Carnian of Tübingen-Lustnau (Baden Württemberg, Germany). F-M, Humeri of *Placodontia* indet. aff. *Cyamodus*. from the early Ladinian (Upper Muschelkalk) of southern Germany (see Table 1 for locality information). F, SMNS 15937. G, Humerus MHI 2112/6. H, Humerus SMNS 15891. I, proximal part of humerus SMNS 54569. J, distal part of humerus SMNS 59831. K, distal part of humerus SMNS 54582. L,

distal part of humerus MHI 697. M, proximal part of humerus MHI 1096. N, Humerus MHI 2112-4 of the marine reptile *Horaffia kugleri* from the middle Ladinian (Upper Muschelkalk/Keuper Grenzbonebed) of Obersontheim-Ummenhofen (Crailsheim, Baden Württemberg, Germany). O, Humerus (SMNS 59827) assigned to *Placodus gigas* (Vogt, 1983; Rieppel, 1995) from the early Ladinian (Upper Muschelkalk) of Hegnabrunn (Franconia, Bavaria, Germany). P-X Humeri and femora of Placodontia indet. P, Placodont humerus MB.R. 454 from the early Anisian (Lower Muschelkalk) of Ohrdruf (Górny Śląsk, Poland). Q, Placodont humerus IGWH 9 from the Anisian (Lower/Middle Muschelkalk) of Freyburg (Unstrut river valley, East-Germany). R, Proximal part of a placodont femur SMNS 84545 from the middle Ladinian (Upper Muschelkalk/Keuper) of Hegnabrunn (Franconia, Bavaria, Germany). S, Placodont femur IGWH 23 from the Anisian (Lower/Middle Muschelkalk) of Freyburg (Unstrut river valley, East-Germany). T, Midshaft region of placodont femur MB.R. 814.2 from the early Anisian (Lower Muschelkalk) of Górny Śląsk (Poland). U, Midshaft region of placodont femur MB.R. Ladinian (Upper Muschelkalk) of Bayreuth (Germany), Midshaft region of placodont femur SMNS 54578 from the early Ladinian (Upper Muschelkalk) of Hegnabrunn (Franconia, Bavaria). W, Midshaft region of placodont femur MB.R. 812 from the early Anisian (Lower Muschelkalk) of Opatowitz (Górny Śląsk, Poland). X, Femur MB.R. 965 from the early Anisian (Lower Muschelkalk) of Górny Śląsk (Poland).