Fossil vertebrates, although some of them are extinct for millions of years, still provide new information about their biology, physiology or even the climatic conditions during their lifetime. To obtain this information, the method of palaeohistology must be used. Palaeohistologists examine the fossilised tissue that animals were growing with during their life. Chemical processes transform the original bone into a mineralised tissue and thus fossilise it. Polarised light microscopy reveals the change of minerals and the orientation of fossilised collagen fibres. This allows the observation of fossilised bone tissues, which are woven bone, parallel-fibered bone and lamellar bone. There are two main bone complexes, fibro-lamellar bone complex (FLB) and lamellar-zonal bone complex (LZB). FLB is formed by woven bone and lamellar bone, whereas LZB is formed by parallel-fibred bone and lamellar bone. FLB is typically found in dinosaurs (sauropods) and most mammals, while LZB is found mostly in amphibians and some reptiles. The herein studied reptile bones belong to the Triassic Archosauriformes clade and especially the pseudosuchian archosaurs, in which a high variety of growth patterns visible in the sectioned long bones was observed previously. The deposition of FLB may be related to thermoregulation, thus it was deposited in endothermic or mesothernic animals. It is therefore astonishing that a group of reptiles, especially in pseudosuchian archosaurs, shows the deposition of both types. A preliminary histological study on the probably first loricatan (pseudosuchian archosaur) from the Upper Triassic of Poland showed, on the structural level a bone tissue that looks like FLB but on the tissue level it lacks the woven bone component, which is why it is referred herein as ‘pseudo-FLB’. Therefore, other loricatans and related clades needs to be re-examined, as this intermediate tissue state might already be present in other taxa, and furthermore, may provide the innovative information on an evolutionary change in tissue deposition. This project aims to re-study the previously published histological data and to section and examine additional taxa to explain why the groups show such a high variation of growth patterns. The questions to be answered are: Where is the origin of true FLB? Why did the animals deposit a certain type of tissue? Was it related to the phylogenetic precursor? Did it depend on the surrounding environment that favoured for the deposition of a particular tissue? Was it a response to the geographical location and thus to a (local) climatic condition? Were some of the groups able to regulate their body temperature and therefore, deposited a certain tissue type? There is also a possibility that the animals were just very plastic in growth and therefore, show a high degree of developmental plasticity. The results obtained will be coded into a characters matrix (presence of FLB, LZB, both or a new bone complex) and will be analysed with the use of phylogenetic techniques. The phylogenetic tree will provide information on the relationships between the groups based on their palaeohistological growth. Perhaps, this will shed light on the origin(s) of the fibro-lamellar bone inside archosaurs.