weight and only intermittently. The pisiform, the prominent carpal bone on the ulnar side of the carpus region, is crucial to the kinetics of tendons on the ulnar side[5]. The size of the pisiform directly relates to function of the hand by affecting the moment of the flexor carpi ulnaris tendon. In humans the pisiform is the smallest carpal bone, supporting complex human wrist articulation, based on the constant rebalance of extension versus flexion[6]. In larger quadrupedal animals like the Iguanodon, the pisiform is very long and prominent, almost acting as the 'heel' of the hand. Here the moment of the flexor tendons is greater, allowing the role of palmar flexion and weight bearing[2].

The largest and most obvious difference lies in the thumb. In humans, the thumb is considered the 'master digit' with opposable abilities critical to the function of the hand. The thumb of the Iguanodon was wildly different with an odd specialisation. The two phalanges of the phalanx and its supporting metacarpal bone were fused together forming a spike, which was conical in shape. The spike was between two and six inches long and its functional use is yet to be proven and highly debated among palaeontologists. Some other dinosaurs with similar thumb anatomy, e.g. Hadrosaurs, lost their thumb, however the Iguanodon did not, hence it must have had some practical use. There have been many theories of its use, including: a self-defence mechanism, a method of breaking open food and also a collector of food via stripping foliage from trees[7]. At one point it was also thought to be a false thumb, present on animals such as the red panda; however false thumbs are flexible when compared to this spike thumb, which is extremely robust.

Finally, the middle three fingers of Iguanodons are largely different to human's middle fingers. They are robust and packed together in comparison, and able to spread far apart via their metacarpophalangeal joints. This compact part of the Iguanodons hand allowed little flexion and was the main weight bearing area that is crucial for quadrupedal animals[8].

In conclusion, the bone structure in the hand of the Iguanodon and the Human, although similar in its basic structure, has many differences due to functional dissimilarities. At a glance, the digits are all clearly different and on closer inspection there are large variations in the anatomy of the carpal region. The anatomical alterations between the two species, determined by the evolutional chain, ensure optimal characteristics for survival in their specific habitats and ecological niche.

[Word count = 940]

References