humerus, NHMUK 37002 (Wellnhofer, 1975), and approximately of equal length to the humerus of Sericipterus, IVPP V14725 (Andres et al., 2010). The slight displacement of the deltopectoral crest along the humeral diaphysis is similar to that in Dorygnathus, Rhamphorhynchus and Nesodactylus (Wellnhofer, 1978). In basal pterodactyloids the medial process is oriented such that the proximal margin faces anterodistally (Wellnhofer, 1991). The morphology of the process is also distinct. While still sub-triangular, in basal pterodactyloids such as Pterodactylus (Fig. 5n), the process is more rounded. In Aurorazhdarcho Frey et al., 2011, the process is more elongate and the distal margin extends further than the proximal, creating a distally deflected sub-triangular shape (Frey et al., 2011) (Fig. 5o). It should be noted that in Cyncorhamphus Seeley, 1870, the process has an orientation closer to that of the new specimen NHMUK PV R36634 (Fig. 5m).

Restriction of the glenoid to the scapula is known only in non-pterodactyloid pterosaurs (Wellnhofer, 1975; Wang and Zhou, 2003a,b; Padian, 2008a,b; Lü et al., 2009, 2010; Wang et al., 2010).

The length vs. width ratio of the humerus appears to be autapomorphic for NHMUK PV R36634. The length–width ratio of NHMUK PV R36634 is 14, which is well above the average for pterosaurs (Table 1). Similar ratios are seen in small-medium sized rhamphorhynchines and the Late Triassic Cuviramus. While Cuviramus does have a hypertrophied diaphysis (Stecher, 2008), it is much straighter than NHMUK PV R36634 and considerably thinner, with a more angular distal epiphysis.

Although a lack of any skull material with NHMUK PV R36634 prevents direct comparison with Parapsicephalus, skull and limb ratios in Dorygnathus may provide a means of identification. The humerus in Dorygnathus is about 70% the length of the distance between the squamosal and anterior margin of the naris. When this ratio is applied to NHMUK PV R36634, the 100 mm long humerus is almost exactly 70% the length of the 140 mm squamosal-nasal opening length in Parapsicephalus (Newton, 1888; Witton, personal communication, 2012). This, combined with the provenance of this specimen and its probable rhamphorhynchine nature allow us to tentatively identify it as cf. Parapsicephalus.

Comparisons between NHMUK PV R36634 and the scapulocoracoids of other pterosaurs are less meaningful. The coracoid is

Fig. 3. The humerus of NHMUK PV R36634 in ventral view. Scale bar = 10 mm.

4.2. Morphological comparisons

The NHMUK PV R36634 humerus is 16% longer than the humerus of MBR 1920.16, and 49% as long as the humerus of SMNS 51100, the largest known Dorygnathus (1.7 m) and Campylognathoides (1.8 m) respectively (Padian, 2008a,b). When compared with the largest Late Jurassic non-monofenestratans with appendicular material, it is 21% longer than the most mature Rhamphorhynchus humerus, NHMUK 37002 (Wellnhofer, 1975), and approximately of equal length to the humerus of Sericipterus, IVPP V14725 (Andres et al., 2010). The slight displacement of the deltopectoral crest along the humeral diaphysis is similar to that in Dorygnathus, Rhamphorhynchus and Nesodactylus (Wellnhofer, 1978). In basal pterodactyloids the medial process is oriented such that the proximal margin faces anterodistally (Wellnhofer, 1991). The morphology of the process is also distinct. While still sub-triangular, in basal pterodactyloids such as Pterodactylus (Fig. 5n), the process is more rounded. In Aurorazhdarcho Frey et al., 2011, the process is more elongate and the distal margin extends further than the proximal, creating a distally deflected sub-triangular shape (Frey et al., 2011) (Fig. 5o). It should be noted that in Cyncorhamphus Seeley, 1870, the process has an orientation closer to that of the new specimen NHMUK PV R36634 (Fig. 5m).

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Comparisons between NHMUK PV R36634 and the scapulocoracoids of other pterosaurs are less meaningful. The coracoid is

Fig. 4. The humeral head (anterodorsal view) and the scapulocoracoid (medial view) of NHMUK R36634. Scale bar = 10 mm.