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Discussion

Borrowed plumes

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Longisquama insignis Sharov, 1970 is an unusual small diapsid reptile of uncertain affinities, described from the Lower Triassic lacustrine deposits of Kyrgyzstan. The strangest feature of the animal consists of two series of elongated, scale-like appendages along its back (the generic name means 'long scale'). Sharov (1970) and Haubold & Buffetaut (1987) interpreted the appendages as parachuting or gliding devices, whereas Bakker (1975) considered them as display structures. Since then, *Longisquama* has become a popular example of early modification for gliding among Mesozoic reptiles (e.g., Wellnhofer 1991).

Recently, Jones *et al.* (2000) went further, interpreting the elongated integumentary appendages of *Longisquama insignis* as 'nonavian feathers in Triassic archosaur'. They pay special attention to the calamus-like bases of the dorsal appendages, which suggests their growth from follicles, as is the case with feathers of modern birds. However, some of the conclusions of Jones *et al.* (2000) have been published before, and other are incorrect or not supported by available data.

Jones *et al.* (2000) were not the first to recognize the similarity between the appendages of *Longisquama* and avian feathers. This similarity and the growth of *Longisquama* appendages from individual follicles was noted in the original description by Sharov (1970), who also suggested that scales similar to those of *Longisquama* might have been expected in hypothetical ancestors of birds. Also Bakker (1975: p. 68) stated that the scales of *Longisquama* 'constituted a structural stage in the evolution of feathers'.

A ribbon-like margin in the distal parts of the dorsal appendages is hardly compatible with their feathery nature proposed by Jones *et al.* (2000). The fused margin of the appendages of *Longisquama* (stronger at the leading edge and weaker at the trailing one) is especially visible in a single appendage (specimen PIN 2584/5) illustrated by Sharov (1970: pl. 8: 2). Therefore, the purported nonavian feathers are better regarded as scales similar to avian feathers, in accordance with the original view of Sharov.

Jones *et al.* (2000) implied that the integumental appendages of *Longisquama* are the only known pre-*Archaeopteryx* feather-like structures. In fact, structures similar to semiplumes of extant birds are present in the imprint of an Early Jurassic sitting theropod from Massachusetts (Gierliński 1996, 1997; Sabath 1997). Also, the wide taxonomic distribution of feathers among many Early Cretaceous theropods from China (Shi & Zhang 2000) indicates that feathers had to appear quite early in theropod evolution.

Some comments in the media suggested that the interpretation of *Longisquama* by Jones *et al.* (2000) demolishes the dinosaur-bird link. But feathers are generally thought to represent modified reptile scales, and finds like that of *Longisquama*, the sitting theropod from Massachusetts or, last but not least, of the famous feathered Chinese dinosaurs seem to illustrate the reptilian potential to develop feather-like structures. The dinosaur-bird link is in no way compromised by discovery of distantly feather-like structures in *Longisquama*. The theropods show much more resemblance to birds in their overall body plan, details of osteology, and even in their plumage.

References

Bakker, R.T. 1975. Dinosaur renaissance. — *Scientific American* **232**, 58–78.

Gierliński, G. 1996. Feather-like impressions in a theropod resting trace from the Lower Jurassic of Massachusetts. *In:* M. Morales (ed.), The Continental Jurassic. — *Museum of Northern Arizona Bulletin* **60**, 179–184.

Gierliński, G. 1997. What type of feathers could nonavian dinosaurs have, according to an Early Jurassic ichnological evidence from Massachusetts? – *Przegląd Geologiczny* **45**, 419–422.

Haubold, H. & Buffetaut, E. 1987. Une nouvelle interprétation de *Longisquama insignis*, reptile énigmatique du Trias supérieur d'Asie Centrale. — *Comptes Rendus de l'Académie des Sciences*, Paris **305**, ser. II, 65–70.

Jones, T.D., Ruben, J.A., Martin, L.D., Kurochkin, E.N., Feduccia, A., Maderson, P.F.A., Hillenius, W.J., Geist, N.R., & Alifanov, V. 2000. Nonavian feathers in a Late Triassic archosaur. — *Science* **288**, 2202–2205.

Shi, L. & Zhang, F. (eds.) 2000. Fifth SAPE Meeting and Jehol Biota Symposium, Beijing 2000. — *Vertebrata PalAsiatica* **38**, supplement, 1–63.

Sabath, K. 1997. Dinosaur feathers. — *Acta Palaeontologica Polonica* **42**, p. 200.

Sharov, A.G. [Šarov, A.G.] 1970. A peculiar reptile from the Lower Triassic of Fergana [in Russian]. — *Paleontologiceskij žurnal* **1**, 127–130.

Wellnhofer, P. 1991. *The Illustrated Encyclopedia of Pterosaurs*. 191 pp. Crescent Books. New York.

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Editorial note

Change in *Acta Palaeontologica Polonica* format

Beginning with the first 2002 issue, the format of *Acta Palaeontologica Polonica* will change to a page size of 210 × 297 mm (ISO 216, A4 paper size).

This change in format will provide more opportunities in manuscript design and make possible the publication of more and larger papers each year, thus reducing publication time. Although the change may be an inconvenience to authors now in the process of preparing manuscripts for *Acta Palaeontologica Polonica*, the Editors will make every effort to make this transition as smooth as possible.

The most important improvement resulting from the new format concerns the illustrations, which can be larger and contain more items. The maximum type area is 168 × 255 mm in size and a single column width is 81 mm. Full page figures should be sufficiently reduced in height to leave space for the captions below, or should fill up the whole type area for captions to be placed on the opposing page. Small size figures should be planned to take up a width of one column.

As of January 2001, all figures in submitted manuscripts must conform to the new format. The maximum length of the paper is set at 120 manuscript pages (compared to previous 80 pages).

The Editors