

Dinosaur footprints from the Upper Jurassic of Błaziny, Poland

Gerard GIERLI-SKI and Grzegorz NIEDŹWIEDZKI



Gierli-ski G. and Nied-wiedzki R. (2002) — Dinosaur footprints from the Upper Jurassic of Błaziny, Poland. *Geol. Quart.*, 46 (4): 463–465.

New dinosaur tracks are reported from the Late Jurassic platform carbonates of Poland. Footprints discovered in a new tracksite of Błaziny resemble large theropod ichnite of *Megalosauripus sensu* Lockley *et al.*, 1998 and sauropod tracks of *Brontopodus* Farlow *et al.*, 1989.

Gerard Gierli-ski, Polish Geological Institute, ul. Rakowiecka 4, PL-00-975 Warszawa, Poland; Grzegorz Nied-wiedzki, Department of Biology, Warsaw University, ul. Miecznikowa 1, PL-02-096 Warszawa, Poland, e-mail: GrzegorzNiedzwiedzki@poczta.net-line.pl (received: April 8, 2002; accepted: August 19, 2002).

Key words: Poland, Late Jurassic, Theropoda, Sauropoda, tracks.

INTRODUCTION

In February 2002, a new Late Jurassic tracksite was discovered on the northeastern flank of the Holy Cross Mountains. This is the third locality in this region where dinosaur footprints have been discovered in Late Jurassic platform carbonates, following the sites of O-arów and Bałtów (Gadzicka *et al.*, 2001; Gierli-ski *et al.*, 2001; Gierli-ski and Sabath, 2002). The new dinosaur footprints were found by the authors and by Konrad Kowalski in the quarry at Błaziny near the town of H-a.

The tracks are preserved as natural casts on isolated blocks of fine-grained oolitic limestone. The track-bearing lithostratigraphic unit was described by Gutowski (1998) as the Błaziny Oolite Limestones of late Oxfordian age.

The theropod footprint and the sauropod trackway (Figs. 1 and 3) are protected and catalogued by the Museum of History of Material Culture in Starachowice (MHKM). The third specimen, a small sauropod ichnite (Fig. 2), was slightly damaged during the excavation in the quarry. A plaster cast made before its unfortunate excavation, is housed in the MHKM, while the original specimen is owned by the senior author.

DESCRIPTION AND DISCUSSION

The large theropod footprint from Błaziny, MHKM GG/3 (Fig. 1), is 43 cm long and 30 cm wide. The angle between digits

II and III equals 29°, while the angle between digits II and IV is 44°. The ratio of footprint length to length of digit III equals 1.81. Among similar large and strictly tridactylous theropod Late Jurassic ichnotaxa, this ratio fits that of *Megalosauripus sensu* Lockley *et al.* (1998). Recently, however, Thulborn (2001) has demonstrated that the name *Megalosauripus* was incorrectly applied to those tracks by Lockley *et al.* (1998). Thus we use this name with quotation marks until a new name is established to label the material described by Lockley *et al.* (1998).

The lack of such “*Megalosauripus*” diagnostic features as discrete digital pads in our specimen might have been caused by the preservational conditions. As noted by Lockley (1998), some “*Megalosauripus*” tracks preserved in platform carbonates lack distinctly imprinted digital pads.

The other Błaziny finds are sauropod tracks of a juvenile and an adult or subadult. The pedal ichnite of the juvenile trackmaker, MHKM GG/4 (Fig. 2), is 19 cm long and 13 cm wide, while the manus is 8 cm long and 12 cm wide. The track of a larger sauropod forms a three-step trackway, MHKM GG/5 (Fig. 3). The pes is 48 cm long and 31 cm wide. The manus is 22 cm long and 32 cm wide. The trackway seems to be of a medium-gauge type. The pes pace angulation equals 92°. The ratio of pace length to pes length is 1.97. Unlike the narrow-gauge trackways of *Parabrontopodus* Lockley *et al.* (1994), the Błaziny specimens show the manual prints located anteromedially to the pes and close to the trackway’s midline, in a fashion similar to that of the wide-gauge trackways of *Brontopodus* Farlow *et al.* (1989).

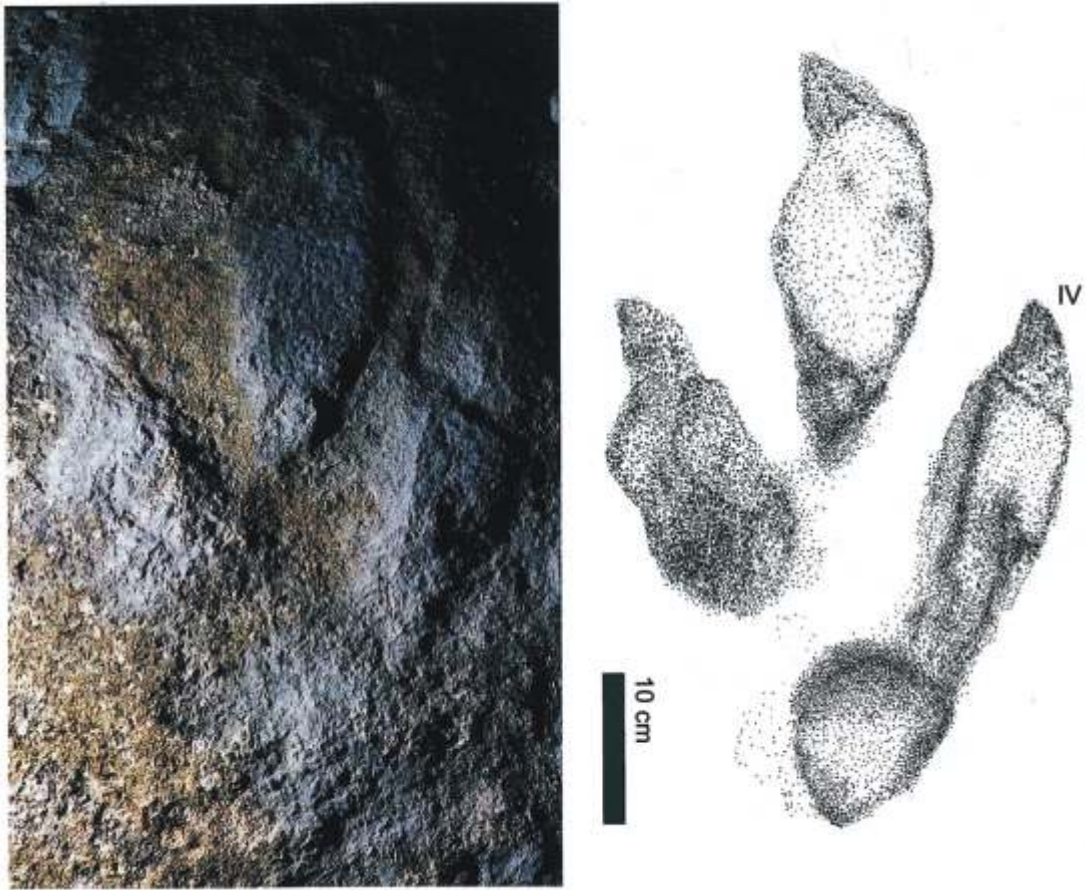


Fig. 1. Large theropod footprint, MHKM GG/3, *Megalosauripus* sp. from the Upper Jurassic of Błaziny, Poland

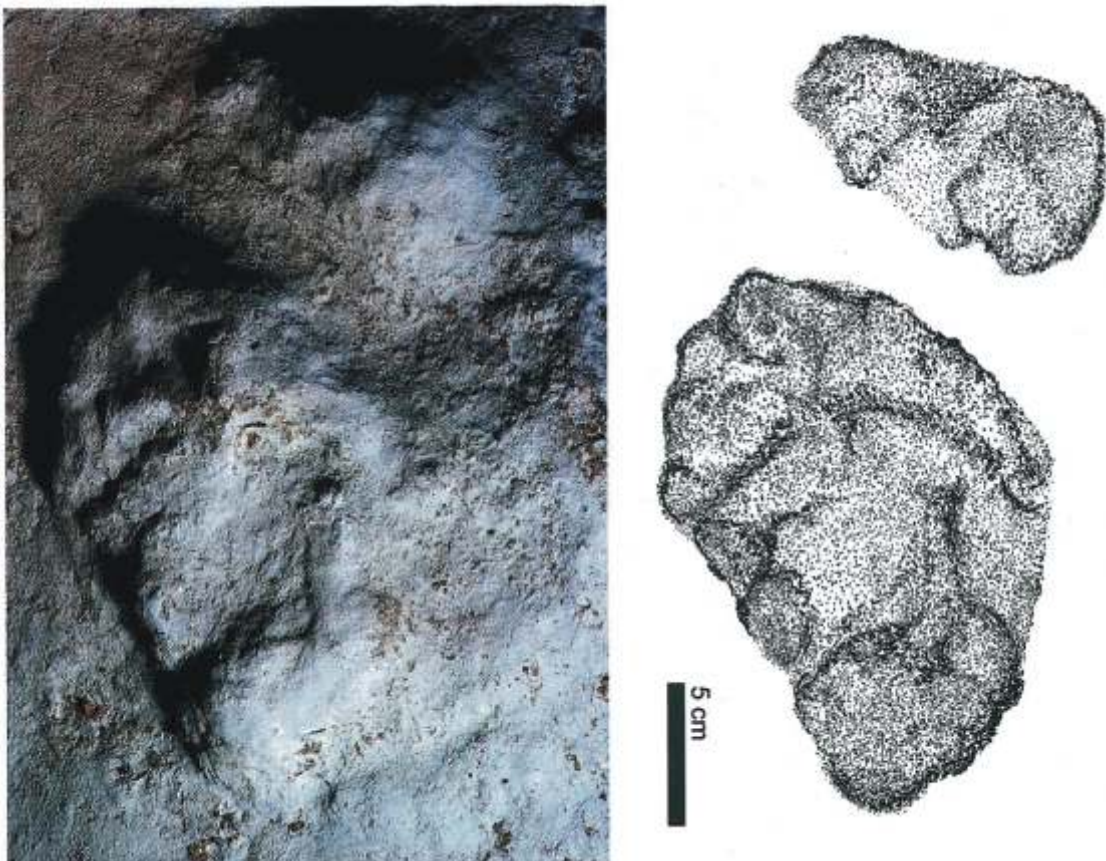


Fig. 2. Small sauropod pes-manus set, MHKM GG/4, *Brontopodus* sp. from the Upper Jurassic of Błaziny, Poland

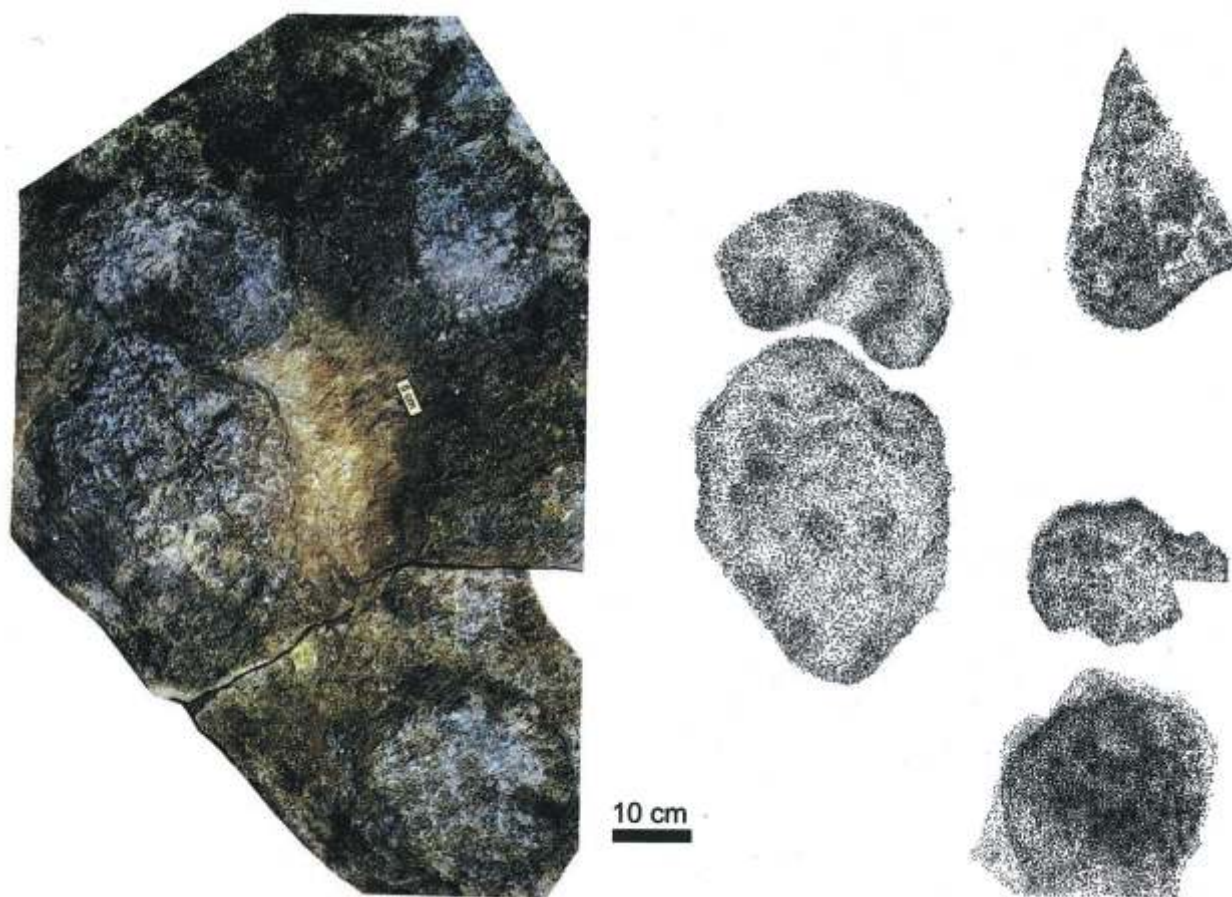


Fig. 3. Sauropod trackway, MHKM GG/5, *Brontopodus* sp. from the Upper Jurassic of Błaziny, Poland

In both specimens from Błaziny (MHKM GG/4 and MHKM GG/5), the manus imprints are relatively large in comparison to the pes. The manus-pes area ratio is 1:2.6 and 1:2.1 respectively, which is also closer to the *Brontopodus* proportions (1:3) than to that of *Parabrontopodus* (1:4 and 1:5), according to the data given by Lockley and Rice (1990) and

Lockley *et al.* (1994). Thus, these features correspond to those of the ichnogenus *Brontopodus*, which is attributed to brachiosaurids (Farlow, 1992) or titanosaurs (Wilson and Carrano, 1999).

REFERENCES

- FARLOW J. O. (1992) — Sauropod tracks and trackmakers: integrating the ichnological and skeletal records. *Zubia*, **10**: 89–138.
- FARLOW J. O., PITTMAN J. G. and HAWTHORNE J. M. (1989) — *Brontopodus birdi*, Lower Cretaceous sauropod footprints from the U. S. Gulf coastal Plain. In: *Dinosaur Tracks and Traces* (ed. D. D. Gillette and M. G. Lockley): 371–394. Cambridge University Press, Cambridge.
- GAŹDZICKA E., GIERLI SKI G. and SMOLE J. (2001) — Dinosaur footprints in the Upper Jurassic of Poland. In: *Jurassic II. Proc. Polish Geol. Soc. Meeting* (eds. G. Pie kowski and J. Grabowski): 7–8. Polish Geol. Soc. Polish Geol. Inst. Starachowice.
- GIERLI SKI G., GAŹDZICKA E., NIEDŹWIEDZKI G. and PIE KOWSKI G. (2001) — New ornithischian dinosaur footprints in the Jurassic of Poland. *Geol. Quart.*, **45** (2): 205–210.
- GIERLI SKI G. and SABATH K. (2002) — A probable stegosaurian track from the Late Jurassic of Poland. *Acta Palaeont. Pol.*, **47** (3): 561–564.
- GUTOWSKI J. (1998) — Oxfordian and Kimmeridgian of the northeastern margin of the Holy Cross Mountains, Central Poland. *Geol. Quart.*, **42** (1): 59–72.
- LOCKLEY M. G. (1998) — Philosophical perspectives on theropod track morphology: blending qualities in the science of ichnology. In: *Aspects of Theropod Paleobiology* (eds. B. P. Pérez-Moreno, T. Holtz Jr., J. L. Sanz and J. Moratalla). *Gaia*, **15**: 279–300.
- LOCKLEY M. G., FARLOW J. O. and MEYER C. A. (1994) — *Brontopodus* and *Parabrontopodus* ichnogen. nov. and the significance of wide- and narrow-gauge sauropod trackways. In: *Aspect of Sauropod Paleobiology* (eds. M. G. Lockley, V. F. dos Santos, C. A. Meyer, and A. P. Hunt). *Gaia*, **10**: 135–145.

- LOCKLEY M. G., MEYER C. A. and SANTOS V. F. dos (1998) — *Megalosauripus* and the problematic concept of megalosaur footprints. In: Aspects of Theropod Paleobiology (eds. B. P. Pérez-Moreno, T. Holtz Jr., J. L. Sanz, and J. Moratalla). *Gaia*, **15**: 313–337.
- LOCKLEY M. G. and RICE A. (1990) — Did “*Brontosaurus*” ever swim out to sea?: Evidence from brontosaur and other dinosaur footprints. *Ichnos*, **1**: 81–90.
- THULBORN T. (2001) — History and nomenclature of the theropod dinosaur tracks *Bueckeburgichnys* and *Megalosauripus*. *Ichnos*, **8**: 207–222.
- WILSON J. A. and CARRANO M. T. (1999) — Titanosaurs and the origin of “wide-gauge” trackways: a biomechanical and systematic perspectives on sauropod locomotion. *Paleobiology*, **25** (2): 252–267.