

## **Magnetostratigraphy constrained by biostratigraphy: the lower Berriasian of the Theodosia coast of southern Ukraine**

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Near Theodosia, around the headland of Ili Burnu (“Cape St Ilya”), there are extensive lower Berriasian outcrops, on which our integrated study has focussed since 2000. Above a massive 2 m+ breccia (the base of the Berriasian of soviet geologists), the upper Dvuyakornaya Fm comprises 80 m of mudstones and grainstones/breccias. Above, *circa* 80 m of micrites and marls, partly inaccessible, are named by us the Mayak Formation. Despite the thickness of the sequence, we can recognise only two faunas, those of the *Berriasella jacobii* (see FRAU et al., 2016) and *Pseudosubplanites grandis* subzones of authors. Long intervals lack any ammonite, but just above the breccia bed a few were assigned to the Jacobi Sbz. (GUZHIKOV et al., 2012); then in the lower Mayak Fm. there is a common Jacobi fauna of *Delphinella* species occurs (+ *Dalmasiceras subloewis*, *Retowskiceras*, spiticeratids & *Berriasella*; but no ‘*B. jacobii*’); and the upper Mayak Fm yields large *Pseudosubplanites* (*P. grandis*, etc). The Occitanica Zone is unknown on this coast. One of our initial aims was to apply the standard calpionellid zonation to the southern Ukrainian sequence. However, loricas *in situ* (not in clasts) are rare and sometimes misleading. Beds about 10 m above the 2 m breccia yield Crassicollaria Zone species, but *Nannoconus kamptneri minor* here suggests this should be Alpina Sbz. Above, calpionellids are rarer, but the lower Mayak Formation yields *Calpionella elliptica* and *C. alpina*, and the upper part *Remaniella colomi* and *Tintinnopsella carpathica*. Zonal boundaries cannot be fixed, but the Alpina, Ferasini and Elliptica subzones are broadly identifiable twixt the 2 m breccia and the top of the Mayak Fm. In the studied interval we identify magnetozones M19n, M18r, M18n and a long M17r (BAKHMUTOV et al., 2016): which is congruent with the M16r noted inland at Zavodskaya Balka (Occitanica-Boissieri zones). In addition to the ammonite biostratigraphic control (only Jacobi Sbz. to Grandis Sbz.: i.e. M19n.2n and above), we can accurately relate first appearances of calcareous nannofossil species to magnetozones. The FADs of *N. steinmannii steinmannii* and *N. kamptneri kamptneri* sit in the lower Mayak Fm, in a reversal we interpret as M18r. Beneath, in the Dvuyakornaya Fm we find nannofossils which in western Tethys appear in M19n: e.g. *N. s. minor*, *N. k. minor*, *N. wintereri*, and *Cruciellipsis cuvillieri*, close to the Alpina Sbz. base. The placing of the Chitinoidella/Crassicollaria zonal boundary (*sensu* PLATONOV et al., 2014) in M19n.2n (misnumbered “M19n.1r”) is unsustainable: elsewhere that boundary occurs in M20n, and of the base of the Calpionella Zone is consistently located in M19n.2n: thus our magneto- and biostratigraphy differ from earlier accounts (GUZHIKOV et al., 2012).

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PLATONOV, E. et al., 2014. Geologica Balcanica, **43**, 63–76.