

Remarks to the abstract:

In general too long, especially the facies part can be reduced to one or three sentences.

Line 20: Be more precise: The area was a marginal marine depositional system, close to a landmass....

Line 22: the deltaic origin is an interpretation, therefore a more neutral term would be better to be applied: mainly to sandy deposits, interpreted to be of deltaic origin...

Line 26: To my knowledge, the "deepest part of the DPT" was mostly applied to the Jurassic to Early Cretaceous history of the basin and not to the Late Cretaceous (e.g. P. Krzywiec, Ziegler)

Line 27: better depositional system and interpret a deltaic origin (Szozdy delta)

Line 30: Interpretation of the depositional system should come after description of the succession (without the interpreted depositional environment)

Line 36: instead the sedimentological detailed description, here is lacking, in which way heavy minerals and palynofacies support the deltaic interpretation.

Line 39: Also the different burial history should be mentioned

The last sentence can be skipped...

Remarks to Introduction

Line 52: a word is missing

Line 61: fragment is not the appropriate word, better geological unit

Line 75: does "axial part" refer to San Anticline or the DPT ?

Line 91: underestimated?

Line 93: sentence is not quite clear to me? Should it not one sentence...as being of deltaic origin - in a place...

Line 104: the succession seems to me comparable to the facies of the Munsterland basin or marginal Upper Cretaceous of the Netherlands, that's why not unique (suggestion: special?)

Line 114: It is not well-defined, because only the deeper parts of the proposed delta are preserved

Line 119: very nice figure; it would be good to add the authors of the "so far interpretation" (Swidrowka, Lesczynski) and the "new Interpretation" (Remin; Irek, recent paper) in the picture

Remarks to State of the art

In general nicely written, good summary; also not too hard adjudicated with respect to the wrong interpretation of basin evolution

Line 170: It would be good to add, how you explained the observed thickness trend, which might indicate a deep basin above the anticline (Marginal trough?)

Line 176: marginal marine sandy deposits form not only in deltas, you have to take also shelf sands or estuaries or shore face sands into consideration. "Sandy" should be better than deltaic.

Remarks to regional setting

Please describe first the whole basin fill.

For me it is not quite clear:

- 1) Does the Late Cretaceous sedimentation in the whole basin starts with the Campanian or is the first transgression (like elsewhere) during the Cenomanian?
- 2) What is the base of the Late Cretaceous succession? Boreholes?
- 3) What is the stratigraphy (name of formations, thickness)?

Line 205: Which kind of fault? Thrust? Normal fault strike-slip fault?

Remarks to material and methods

How many sections were documented or compared except the Szozdy section (also to correlate the development of cycles with the main section)?

How long is the section? Which stratigraphic

Remarks to Results Sedimentology

It would be better to describe the section in a more general way: How thick, which rocks can be distinguished; fossils, features, sedimentary structure, diagenesis....

Line 267: How many cycles were documented? How thick they are?

Line 276: quartz is fine-grained – no silt (below 0,063 mm)?

Line 279: bioturbations: better trace fossils (also describe the type and genus of trace fossils)

Line 280: poorly preserved

Line 282: poorly cemented

Line 293: strongly cemented

General remark: The description of calcareous gaise unit point in my opinion more to a fully marine and not to a deltaic environment. I would consider slower shoreface sands. My argument is the abundance of shells of fully marine organisms, which would be sparse in brackish water. Especially corals do not occur in recent deltaic settings.

Remarks to Results Heavy Minerals

I agreed that Hilmar von Eynatten made his remarks in the discussion, because he is a specialist. Originally, we were both invited to make a review but we decided that I make the main review. Please consider his remarks consequently.

The preservation of heavy minerals depends strongly on the grain size. Is the grain size the same in the different units of the cyclothem?

370: I see no separate groups in the ternary diagrams, but continuous chemistry in a relatively wide range.

Remarks to Results Palynofacies

No remarks

Remarks: Distribution of the CaCO₃ and the thickness pattern of the Campanian deposits

Line 418: Remove CaCO₃ (carbonate or CaCO₃)

The problem of this method is that you compare possibly different rock types and it not noted on which data (how many samples) it is based. This should be added.

Line 433: Clayey

Please add some sentences to **Thickness pattern**: What was the base to define the boundary to the underlying succession (Santonian)? Lithostratigraphy or biostratigraphy (This could be added also in the chapter Methods)

Remarks to Interpretation and Discussion

In general: The interpretation of facies is based on rocktypes, grain-size, fossils, sedimentary structures. It is not very common to start with the size range of heavy minerals.

Line 470: You should avoid to mention already your preferred interpretation of the sedimentary environment. The observed differences would also fit to a river in a plain or to a shelf, not necessarily to a delta.

Line 475: I am in doubt that any heavy mineral is transported in suspension (especially in low energy rivers)

Palynofacies seems to be ok.

Sedimentary environment – this chapter should be moved to 6.1!

531: Are there no boreholes with similar facies?

I do not fully agree with the interpretation. Similar cycles were interpreted to be of poorly marine origin (shelf environment). Of course the delivery of clastic material comes mainly from rivers, but redistribution on the shelf by storms, waves and tides is mostly much more effective than river action. Only very large rivers (Nile, Amazonas, Mississippi, Lena) can produce major deltas. Please consider also a shelf environment with lower and upper shoreface sands; What is the argument to focus on the deltaic system?

Lines 538-540: It is better to argue with the observation and not to start with the interpretation:

1. The meaning of grainsize, sorting, composition (glaucony, shell debris), fossils (corals, echinoderms), sedimentary structures and so on should be considered concerning their significance or exclusive feature of an environment (Marine versus Fluvial or Aeolian)
2. After that two or three possible sub environments will remain; they must be all discussed. The decision for the one or the other interpretation must be after some distinct criteria.
3. I would suggest to use additionally the nice text book of Posamentier & Walker 2006 Facies models revisited. You will find a lot of examples both for deltas and clastic shelves.

Line 565: of course you can interpret a delta with mouthbars, but shelf environments and even storm and tide-dominated deltas show well-arranged cyclic successions (mostly produced by sea-level fluctuations)

Line 575: the subaquatic part of a delta (not the proximal, fluvial dominated part) is a reasonable interpretation; but a similar or even identical pattern would be produced on a shelf.

Fig. 11: I agree with the interpretation. The delta-lobe is only visible in a large scale. You need more outcrops to prove this interpretation. Otherwise there is no chance to distinguish them from normal shelf sediments.

590: not in every case; also parasequences within a sequence show varying thickness.

605: Mostly, cementation of clastic deposits occurs during burial (sea-water is undersaturated)

Is gaise synonymous to Opoka? Siliceous or calcitic cement? The calcareous siltstones of Germany and the Bohemian Cretaceous basin look quite similar and are interpreted as bioturbated lower shore face sediments (complete mixture of sand, clayminerals, silt and coccolithic mud). Sponge spicules occur frequently like calcispheres and inoceramid fragments.

My main argument against the deltaic environment is the occurrence of ammonites. They should be full marine and not brackish.

637: please add also Surlyk for Denmark

640: The extension of the landmass is sufficient to produce a delta?

Fig. 13: The map for early Campanian, Maastrichtian is in parts wrong; especially in the German and Danish part. Harz mountains, Flechtingen high is missing as well as the northern segment of the inverted Danish-Polish trough and the inverted Lower Saxony basin together with the dutch neighbours and the structures in the North Sea,

Up to 650 very speculative, because no evidence of such currents are visible from the sedimentological point of view.

675-680. This is very important and should also mentioned in the introduction.

670 I suggest rewriting: delta distributary avulsion occurs without any tectonic pulse. It is not possible to conclude it from the database. It is well known that subsidence is triggered by the load of the inverted/uplifted block (see the papers of Nielsen and Hansen about marginal troughs). From this point of view you discovered a new inversion structure which fits very good to other examples– no need to produce a different story with tectonic pulses.

The part about provenance would be better placed in a separate paper, because it starts a new story. The provenance interpretation is still highly speculative because no data for comparison exist.

Remarks: Towards the understanding of late Cretaceous facies distribution

This should be placed directly behind the Interpretation (also if you do not include the provenance part)

The new interpretation of Opoka is very important but should be placed already to a chapter before (discussion of the sedimentary environment); because your main discovery seems to be the inversion structure San Anticline.

812: paleobathymetric or palaeobathymetric

819: I think a similar sedimentary model (possibly without to name opokas) was initially also proposed by Wilmsen 2003: Sequence stratigraphy and palaeoceanography of the Cenomanian Stage in northern Germany (Cret. Res. 24/5: 525-568)

The last chapter can be shortened. The program is very good; but I would suggest to move the whole provenance chapter with the heavy minerals to a later chapter. You should include the zircon age spectra over the complete late Cretaceous section.