

***Interactive comment on “The Imbert Formation of northern Hispaniola: a tectono-sedimentary record of arc-continent collision and ophiolite emplacement in the northern Caribbean subduction-accretionary prism” by J. Escuder-Virue et al.***

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First of all, we would like to express our gratitude to the referee Dr Paul Ryan for the overall positive assessment of our manuscript. The constructive comments and suggestions helped to improve this contribution.

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Best regards,

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Reviewer #1 Paul Ryan

General Comments:

Comment: The article, The Imbert Formation of northern Hispaniola: a tectono-sedimentary record of arc-continent collision and ophiolite emplacement in the northern Caribbean subduction-accretionary prism by J. Escuder-Virue , A. Suárez-Rodríguez , J. Gabites , and A. Pérez-Estaún presents stratigraphic, structural, geochemical, petrological and geochronological evidence to support their contention that the Imber Formation originated as a fore-arc basin that evolved into a piggy back basin during arccontinent collision of the Caribbean Plate with the Bahama Platform. The data clearly implies that early deposits were intercalated with arc related vulcanism, whilst later and coarsening upwards deposits contained deformed and metamorphosed material from the ophiolitic basement. Whilst the individual data sets are not particularly large, each supports the other in establishing their model. I believe that the conclusions reached are justified, especially because I have experience in working in lower Palaeozoic rocks which have been interpreted in a similar manner. The diagrams are clear and useful as are the references. Extra data is presented in the supplemental files. Overall, I enjoyed the article and accept the authors conclusions as being reasonable. The article reinforces the important point that orogeny can occur below sea-level.

Answer: We have more regional cartographic, stratigraphic, structural and geochemical data that reinforce our interpretations, but these data have not been included due to space limitations in the Journal and because they will unnecessarily longer the paper. The geological context of the Imbert Fm and the Puerto Plata ophiolitic complex is described in the referenced bibliographic publications including our other previous

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works.

#### Specific Comments:

I feel the article could be improved on two fronts. Firstly, the text should be run through a grammar checker. There are many minor grammatical errors, some of which I list below (see 'Technical Corrections'). EU and US spelling of metric units are used in the text, which makes me suspect that whilst the authors have each written their own sections, the final manuscript has not been copy edited by one author. In the list of corrections I also include some suggestions which might improve idiomatic usage.

The second and most important way in which I believe the article could be improved is to enlarge the discussion section. Comparison of the the Imbert Formation basin with other such basins elsewhere in the world is limited to very general terms in the last 8 lines of the article. An obvious correlative for perhaps both the Imbert Formation and the El Mamey Group would be the Ordovician South Mayo Trough of western Ireland (see Ryan and Dewey 2011 and Dewey and Mange 1999). The deformation in the fore-arc during the early stages of arc continent collision (ACC) in Taiwan is well documented (see, for example, Lin et al. 2009) as is the composition of the sediments in the basins in the ACC zone (Yen & Lundberg 2006). A fuller discussion would widen readership and hence citations.

Answer: In the revised version of the paper, we have incorporated all of the references and language corrections as suggested by Dr. Ryan and commented briefly the discussion section by comparing the Imbert Fm with other analogous sedimentary units in other arc-continent collision elsewhere in the world. In consequence, some suggested bibliographic references have also been added. Unfortunately, a full comparison of the sedimentary evolution of several syn-collision units is beyond the scope of this contribution. Further, from our knowledge, we are not sure that the early syn-collision sedimentary evolution and structural context of Imbert Fm are similar to that of Taiwan and Western Ireland arc-continent collision basins.

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#### Comments: Technical Corrections and Suggestions:

Key Page/Line original text = suggested correction 1828/18 coatic = chaotic 1829/05 differ of = differ from 1829/14 to a mélange = as a mélange 1829/17 deducted = deduced 1829/19 evidences = evidence 1830/17 edified= developed? 1830/20 there exist = there are 1832/29 has been = have been 1833/16 disagree = disagrees 1839/18 disposed over = overlies? 1839/26 coatic=chaotic 1840/09 carries=quarries? 1840/28 variocolored =varicoloured 1841/02 coatic=chaotic 1843/15 volcaniclastis = volcanoclastic rocks 1843/18 first use of Hbl, please define 1845/10 and no contained = and had no contained? 1846/15 caotic = chaotic 1848/24 carry = quarry 1849/07 carry =quarry 1850/13 By other hand = On the other hand? Or Alternatively? 1850/26-27 A coeval syn-sedimentary tectonics is apparently absent = Evidence of coeval syn-sedimentary tectonics is absent? 1850/28 alternance of = alternating? 1851/13 unconformable = unconformably 1851/16 already structured = already deformed? 1851/20 unconformably overlies = unconformably overlies 1851/23-24 rule out = ruled out 1851/28 By other hand = Also? 1852/11 results = result 1853/01 axe = axis? 1853/07 results = result 1853/20 would be presumed to be = are presumed to be? 1853/26 indicate = indicates or suggests? (indicate used in next sentence) 1854/04 the coeval sedimentation of the Imbert Fm (IM2 and IM3), as also implying the coeval sedimentation of the Imbert Fm (IM2 and IM3), consistent with? 1854/15 relations = relationship 1854/20 coeval to = coeval with 1854/27 in a shallow = at a shallow? 1854/28-29 better as: All sections of the Imbert Fm in the RSJC are unconformably overlain by the La Toca Fm, which contains in the lowermost strata middle to- upper 1855/26 caotic = chaotic 1856/15 agree = agrees 1856/16 as marbles = of marbles? or such as marbles? 1856/25 madure = mature 1857/02 up gradation = upwards gradation?

Answer: all these corrections have been made in the manuscript

References: Dewey, J.F., and Mange, M.A. 1999. Petrography of Ordovician and Silurian sediments in the western Irish Caledonides: tracers of a short-lived Ordovi-

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cian continent-arc collision orogeny and the evolution of the Laurentian Appalachian-Caledonian margin. Geological Society of London Special Publication, 164: 55-107.

Lin, A T., Yao, B. Hsu, S-K, Liu, C-S, and Huang, C-Y. 2009. "Tectonic Features of the Incipient Arc-Continent Collision Zone of Taiwan: Implications for Seismicity." *Tectonophysics* 479 (1-2): 28–42. doi:doi: DOI: 10.1016/j.tecto.2008.11.004.

Ryan, P.D., and Dewey, J.F. 2011. Arc-continent collision in the Ordovician of western Ireland: stratigraphic, structural and metamorphic evolution. In *Arc-continent collision*. Edited by Brown, D. and Ryan, P.D., *Frontiers in Earth Sciences*, Springer Verlag, Berlin Heidelberg. pp. 373-401

Yen, J-Y, and Lundberg, N. 2006. "Sediment Compositions in Offshore Southern Taiwan and Their Relations to the Source Rocks in Modern Arc-Continent Collision Zone." *Marine Geology* 225 (1-4): 247–63. doi:doi: DOI: 10.1016/j.margeo.2005.09.003.

Answer: all these references have been added in the manuscript

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