**Supplemental Information**

1. **Description of eggshell specimens**

Elongatoolithidae Zhao, 1975

 *Macroolithus* Zhao, 1975

 *Macroolithus yaotunensis* Zhao, 1975

(Laid by the oviraptorid *Heyuannia huangi*)



**Figure S1** Photographs of the *Macroolithus yaotunensis* sample from (A) the Liguanqiao Basin in Henan and (B) Nanxiong Basin in Guangdong Provinces, China under the light polarized microscope. The red dashed line marks the undulating boundary between the prismatic layer and mammillary layer, which characterizes the oospecies *Macroolithus huangi*. ML, mammillary layer; PL, prismatic layer.

1. **Raman band assignment**

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| Wavenumbers | Assignment | References |
| 957-962 | ν1PO4, P–O | Crane et al., 2006 |
| 967 | ν1 symmetric $PO\_{4}^{3-}$ stretching | Walters et al., 1990; Gergely et al. 2010; Frost et al., 2014; Igic et al., 2015 |
| 970 | ν1PO4, P–O | Crane et al., 2006; Igic et al., 2015 |
| 980 | $PO\_{4}^{3-}$ or $HPO\_{4}^{2-}$ | Sauer et al., 1994; Crane et al., 2006; Igic et al., 2015 |
| 1087 | ν1 symmetric CO3 stretching | Gunasekaran, Anbalagan & Pandi, 2006 |

**Reference**

Gergely G, Wéber F, Lukács I, Tóth AL, Horváth ZE, Mihály J, Balázsi C. 2010. Preparation and characterization of hydroxyapatite from eggshell. Ceramics International 36:803-806. DOI: 10.1016/j.ceramint.2009.09.020

Gunasekaran S, Anbalagan G, Pandi S. 2006. Raman and infrared spectra of carbonates of calcite structure. *Journal of Raman Spectroscopy* 37(9):892-899. DOI:10.1002/jrs.1518

Igic B, Fecheyr-Lippens D, Xiao M, Chan A, Hanley D, Brennan PRL, Grim T, Waterhouse GIN, Hauber ME, Shawkey MD. 2015. A nanostructural basis for gloss of avian eggshells. *Journal of The Royal Society Interface* 12:20141210. DOI: 10.1098/rsif.2014.1210

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