

**Appendix 1. Measurements for heart-shaped teeth of Lusitanian Basin**

| <i>Tooth</i>  | <i>Locality</i>       | <i>Formation*</i>                | <i>Age*</i>                        | <i>Wear</i>             | <i>Morphotype</i> | <i>max. height</i> | <i>Width at the base</i> | <i>Width at apex base</i> | <i>Max height of apex</i> | <i>Height apex/total height</i> | <i>SI</i> | <i>LOG SI</i> |
|---|-----------------------|----------------------------------|------------------------------------|-------------------------|-------------------|--------------------|--------------------------|---------------------------|---------------------------|---------------------------------|-----------|---------------|
| SHN (JJS) 127   | Valmitão Norte        | Praia de Amoreira-Porto Novo Fm. | upper Kimmeridgian-basal Tithonian | moderate                | III or II         | 28,80              | 19,50                    | 23,90                     | 15,16                     | 0,526                           | 1,205     | 0,08099       |
| SHN (JJS) 128   | Praia dos Frades      | Praia de Amoreira-Porto Novo Fm. | upper Kimmeridgian-basal Tithonian | absent/weak             | III               | 29,00              | ?                        | 26,00                     | 7,90                      | 0,272                           | 1,115     | 0,04742       |
| SHN (JJS) 129   | Praia de Pedrogãos    | Praia de Amoreira-Porto Novo Fm. | upper Kimmeridgian-basal Tithonian | strong                  | ?                 | 28,59              | ?                        | ?                         | 13,10                     | 0,458                           | ?         | ?             |
| SHN (JJS) 130   | Praia de Pedrogãos    | Praia de Amoreira-Porto Novo Fm. | upper Kimmeridgian-basal Tithonian | strong                  | II                | 19,11              | 11,00                    | 17,10                     | 7,00                      | 0,366                           | 1,118     | 0,04826       |
| SHN (JJS) 131   | Praia dos Frades      | Praia de Amoreira-Porto Novo Fm. | upper Kimmeridgian-basal Tithonian | moderate                | I                 | 41,45              | 22,70                    | 27,00                     | 22,15                     | 0,534                           | 1,535     | 0,18616       |
| SHN (JJS) 132   | São Bernardino        | Praia de Amoreira-Porto Novo Fm. | upper Kimmeridgian-basal Tithonian | moderate                | I                 | 39,35              | 27,30                    | 28,00                     | 20,85                     | 0,530                           | 1,405     | 0,14779       |
| SHN (JJS) 133   | Valmitão Norte        | Praia de Amoreira-Porto Novo Fm. | upper Kimmeridgian-basal Tithonian | absent/weak             | I                 | 43,75              | ?                        | ?                         | ?                         | ?                               | ?         | ?             |
| SHN (JJS) 135   | Valmitão Norte        | Praia de Amoreira-Porto Novo Fm. | upper Kimmeridgian-basal Tithonian | moderate                | II                | 35,35              | 19,45                    | 26,80                     | 18,60                     | 0,526                           | 1,319     | 0,12025       |
| SHN (JJS) 136   | Porto das Barcas      | Sobral Fm.                       | lower Tithonian                    | moderate                | ?                 | ?                  | ?                        | 25,00                     | 18,50                     | ?                               | ?         | ?             |
| SHN (JJS) 139   | Praia da Corva        | Praia de Amoreira-Porto Novo Fm. | upper Kimmeridgian-basal Tithonian | moderate                | III               | 42,90              | 22,2                     | 32,90                     | 12,60                     | 0,294                           | 1,304     | 0,11526       |
| SHN (JJS) 140   | Cambelas              | Freixial Fm.                     | Tithonian                          | absent/weak to moderate | I                 | 46,11              | 21,00                    | 25,50                     | 28,00                     | 0,607                           | 1,808     | 0,25725       |
| SHN (JJS) 141   | Baleal                | Praia de Amoreira-Porto Novo Fm. | upper Kimmeridgian-basal Tithonian | moderate                | II                | 32,90              | 16,95                    | 23,60                     | 13,90                     | 0,422                           | 1,394     | 0,14428       |
| SHN (JJS) 142   | Praia da Corva        | Praia de Amoreira-Porto Novo Fm. | upper Kimmeridgian-basal Tithonian | absent/weak             | I                 | 41,95              | 22,30                    | 26,99                     | 24,30                     | 0,579                           | 1,554     | 0,19153       |
| SHN (JJS) 146   | Salir do Porto        | Alcobaça Fm.                     | lower Kimmeridgian                 | absent/weak             | III               | ?                  | ?                        | ?                         | ?                         | ?                               | ?         | ?             |
| SHN (JJS) 147   | Salir do Porto        | Alcobaça Fm.                     | lower Kimmeridgian                 | absent/weak             | II                | 35,20              | 18,80                    | 24,70                     | 17,00                     | 0,483                           | 1,425     | 0,15385       |
| SHN (JJS) 148   | ?                     | ?                                | ?                                  | moderate                | II                | 32,25              | 15,90                    | 22,80                     | 12,50                     | 0,388                           | 1,414     | 0,15059       |
| SHN (JJS) 149   | ?                     | ?                                | ?                                  | strong                  | III               | 25,4               | 17,90                    | 23,90                     | 7,50                      | 0,295                           | 1,063     | 0,02644       |
| SHN (JJS) 151   | Salir do Porto        | Alcobaça Fm.                     | lower Kimmeridgian                 | moderate                | ?                 | ?                  | ?                        | ?                         | ?                         | ?                               | ?         | ?             |
| SHN (JJS) 154   | Salir do Porto        | Alcobaça Fm.                     | lower Kimmeridgian                 | absent/weak             | ?                 | ?                  | ?                        | ?                         | ?                         | ?                               | ?         | ?             |
| SHN (JJS) 504   | Salir do Porto        | Alcobaça Fm.                     | lower Kimmeridgian                 | absent/weak             | ?                 | ?                  | ?                        | ?                         | ?                         | ?                               | ?         | ?             |
| SHN 134   | Valmitão              | Praia de Amoreira-Porto Novo Fm. | upper Kimmeridgian-basal Tithonian | absent/weak             | ?                 | ?                  | ?                        | ?                         | ?                         | ?                               | ?         | ?             |
| SHN 137   | São Bernardino        | Praia de Amoreira-Porto Novo Fm. | upper Kimmeridgian-basal Tithonian | absent/weak             | III               | 24,30              | 15,25                    | 19,70                     | 6,40                      | 0,263                           | 1,234     | 0,09114       |
| SHN 138   | Porto Novo            | Praia de Amoreira-Porto Novo Fm. | upper Kimmeridgian-basal Tithonian | absent/weak             | II                | 37,00              | 23,3                     | 26,00                     | 16,95                     | 0,458                           | 1,423     | 0,15323       |
| SHN 143   | Valmitão Norte        | Praia de Amoreira-Porto Novo Fm. | upper Kimmeridgian-basal Tithonian | moderate                | ?                 | 36,00              | 16,90                    | 25,60                     | 17,50                     | 0,486                           | 1,406     | 0,14806       |
| SHN 144   | Porto Dinheiro        | Sobral Fm.                       | upper Kimmeridgian-lower Tithonian | absent/weak             | II                | 32,10              | 15,90                    | 24,10                     | 15,00                     | 0,467                           | 1,332     | 0,12449       |
| SHN 145   | Praia da Corva        | Praia de Amoreira-Porto Novo Fm. | upper Kimmeridgian-basal Tithonian | moderate (?)            | II                | ?                  | 24,40                    | 29,90                     | ?                         | ?                               | ?         | ?             |
| SHN 150   | Serra do Bouro        | Bombarral Fm.                    | Tithonian                          | moderate                | II                | ?                  | ?                        | 23,95                     | ?                         | ?                               | ?         | ?             |
| SHN 152   | Serra do Bouro        | Bombarral Fm.                    | Tithonian                          | moderate                | I or II           | 28,6               | 14,30                    | 17,20                     | 13,10                     | 0,458                           | 1,663     | 0,22084       |
| SHN 153   | Porto Dinheiro        | Sobral Fm.                       | upper Kimmeridgian-lower Tithonian | absent/weak             | II                | 25,30              | ?                        | ?                         | 9,10                      | 0,360                           | ?         | ?             |
| SHN 501   | Praia da Gralha       | Alcobaça Fm.                     | lower Kimmeridgian                 | moderate                | I                 | ?                  | ?                        | ?                         | ?                         | ?                               | ?         | ?             |
| SHN 502   | Foz do Arelho         | Bombarral Fm.                    | Tithonian                          | absent/weak             | I                 | 32,6               | ?                        | ?                         | 17,2                      | 0,528                           | ?         | ?             |
| SHN 503   | Foz do Arelho         | Bombarral Fm.                    | Tithonian                          | moderate                | II                | 32,3               | 20,7                     | 24,9                      | 19,1                      | 0,591                           | 1,297     | 0,11300       |
| SHN 505   | Valmitão Sul          | Praia de Amoreira-Porto Novo Fm. | upper Kimmeridgian-basal Tithonian | absent/weak             | III(?)            | ?                  | ?                        | ?                         | ?                         | ?                               | ?         | ?             |
| SHN 506   | Valmitão Norte        | Praia de Amoreira-Porto Novo Fm. | upper Kimmeridgian-basal Tithonian | moderate to strong      | II                | ?                  | ?                        | ?                         | 15,4                      | ?                               | ?         | ?             |
| SHN 507   | Valmitão Sul          | Praia de Amoreira-Porto Novo Fm. | upper Kimmeridgian-basal Tithonian | moderate                | ?                 | ?                  | ?                        | ?                         | ?                         | ?                               | ?         | ?             |
| SHN 508   | Serra do Bouro        | Bombarral Fm.                    | Tithonian                          | absent/weak             | II                | 33,5               | 18,35                    | 25                        | 14,95                     | 0,446                           | 1,340     | 0,12710       |
| SHN 509   | Valmitão Sul          | Praia de Amoreira-Porto Novo Fm. | upper Kimmeridgian-basal Tithonian | absent/weak             | II                | 20,1               | 8,65                     | 15,2                      | 8,6                       | 0,428                           | 1,322     | 0,12135       |
| SHN 510   | Praia da Corva        | Praia de Amoreira-Porto Novo Fm. | upper Kimmeridgian-basal Tithonian | strong                  | ?                 | ?                  | ?                        | 28,45                     | 11,8                      | ?                               | ?         | ?             |
| SHN 511   | ?                     | ?                                | ?                                  | ?                       | II                | ?                  | ?                        | 27,3                      | ?                         | ?                               | ?         | ?             |
| SHN 512   | Foz de Arelho         | Bombarral Fm.                    | Tithonian                          | absent/weak             | II                | 19,1               | 8,65                     | 12,95                     | 7,65                      | 0,401                           | 1,475     | 0,16876       |
| MG 4832   | São Martinho do Porto | Alcobaça Fm.                     | lower Kimmeridgian                 | moderate                | II                | 34                 | 18                       | 23                        | ?                         | ?                               | 1,478     | 0,16975       |
| MG 277  | Fervença              |                                  | lower Kimmeridgian                 | ?                       | ?                 | ?                  | 21                       | 24                        | ?                         | ?                               | ?         | ?             |
| middle-to-upper Oxfordian or Kimmeridgian-basal Tithonian |                       |                                  |                                    |                         |                   |                    |                          |                           |                           |                                 |           |               |
| MG 16   | Ourém                 | Montejunto or Alcobaça Fm.       | basal Tithonian                    | ?                       | ?                 | ?                  | ?                        | ?                         | ?                         | ?                               | ?         | ?             |

\*(sensu Manuppella et al., 1999; Kullberg et al., 2006; Azerêdo et al., 2010)