A new species of the barnacle genus *Tesseropora* (Crustacea: Cirripedia: Tetraclitidae) from the Early Pliocene of Fuerteventura (Canary Islands, Spain)

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A new barnacle species, *Tesseropora canariana* sp. nov., from Lower Pliocene shoreline deposits of western Fuerteventura is described. It represents the first record of the genus *Tesseropora* from the Canary Islands. The compartment of the new species is morphologically very similar to *T. dumortieri* (Fischer, 1866) from the Miocene of the western Tethys and eastern Atlantic coast and to *T. sulcata* Carriol, 1993 from the Upper Pliocene French Atlantic coast. It is an early example of an Atlantic island population of this genus and documents its Neogene transatlantic dispersal. Lithofacies, taphonomy and faunal association at the type locality indicate epiphytical fixation of the barnacles under warm-subtropical conditions at a high-energy, rocky shoreline.

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Introduction

Fossil barnacles from uplifted Neogene shore sediments at the Canary Islands have so far been reported only by Simonelli (in Rothpletz & Simonelli 1890) in their classical monograph on the Lower Pliocene Las Palmas Formation of Gran Canaria. He noticed several compartments of a balanid which he tentatively referred to the extant species *Perforatus* cf. *perforatus* (Bruguière, 1789), and a single radial plate of a second taxon. The latter was described under a new binomen, *Chenolobia hemisphaerica* Simonelli (in Rothpletz & Simonelli 1890: 724, pl. XXXVI, figs. 2, 2a-b). Since Simonelli introduced the new taxon explicitly as "n. sp." and stressed the similarity of his new species to extant members of the coronulid genus *Chelonibia* Leach, 1817, '*Chenolobia*' is apparently an "error typographicus" and represents technically a "nomen nudum". '*Chenolobia*' *hemisphaerica* was intentionally a member of the genus *Chelonibia* in the original description, where it currently resides in the most recent overviews (Ross & Frick 2007; Epibiont Research Cooperative 2007: 31, as *C. hemispherica* [sic!]).

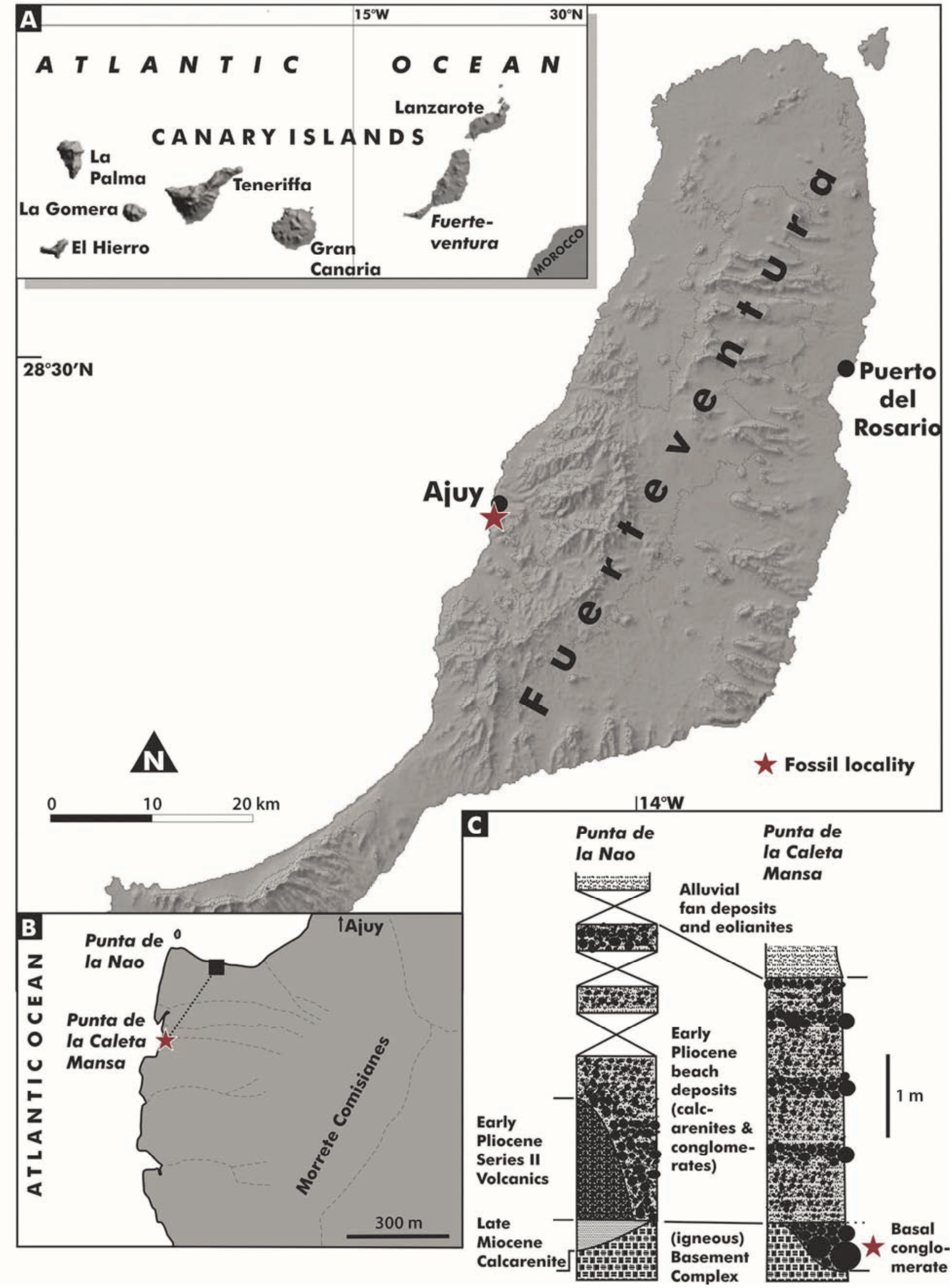

Fig. 1: **(A–B)** Location of the sampled outcrop at Punta de la Caleta Mansa, south of Ajuy, Fuerteventura, Canary Islands, Spain. **(C)** Lithostratigraphy of the type strata of *T. canariana* sp. nov. The Basal Complex is Jurassic to Miocene, the alluvial fan deposits and eolianites are Pliocene to Recent in age (see text).

In this study, the first record of the tetraclitid genus *Tesseropora* Pilsbry, 1916 from the Canary Islands is described, which originates from Lower Pliocene beds of western Fuerteventura. Fossil species of the genus *Tesseropora* have been so far described from the Mediterranean-Tethyan (Oligocene–Miocene), eastern Atlantic (Late Pliocene) and eastern Pacific (Pliocene) realms (Zullo 1968; Carriol 1993, 2005, 2008). Extant members of this genus inhabit the Indopacific and island shores in the Atlantic Ocean (e.g., Nilsson-Cantell 1921; Newman & Ross 1977; Young 1998; Southward 1998; Wirtz et al. 2006).

Material and methods

Material collection and geological setting

The material was collected from uplifted shore sediments (Meco & Stearns 1981; Meco & Pomel 1985; Meco et al. 2007) at the western coast of the Island of Fuerteventura ~1.5 km south of the village of Ajuy (Puerto de la Peña, Figs. 1A–B).

In this area, the Jurassic to Neogene sedimentary-magmatic Basement Complex (LeBas et al. 1986; Balogh et al. 1999) was truncated by a Miocene shore-plate, today elevated to 6–12 m a.s.l. (Fig. 1C). This erosive surface was subsequently overlain by ~1 m of Upper Miocene (Upper Tortonian, Rona & Nawalk 1970) shallow-water calcarenites.

The calcarenitic unit is south of Ajuy covered by basaltic lava flows of the volcanic Series II (*sensu* Fúster et al. 1968, 1984), which erupted during the Plio-Pleistocene subaerial volcanic phase of the island (Stillman 1999). The lava flows intercalate distally with coeval hyaloclastites and coarse-grained beach deposits. Subsequent erosion locally reactivated the pre-Upper Miocene shore-plate on top of the Basement Complex. This reactivated shore-plate and the lava flows of Series II are overlain by onlapping coarse-grained, clastic beach deposits. These are ranging in grainsize from micritic mudstone and coarse-grained sand to boulders up to 70 cm in diameter. The units, which contain the material described herein, can be subdivided into several subunits. The basal unit (Fig. 1C) consists of a highly fossiliferous, clast supported, cobble to large boulder conglomerate. The clasts derive mainly from the underlying basal complex rocks and in minor parts from epiclastic volcanics of the island edifice. The matrix consists of a buff-colored, sandy biomicrite. Double-valved specimens of the deep-burrowing bivalve *Eastonia* sp. are preserved in vertical life-position within matrix-filled cavities between large blocks. Other molluscs include *Nerita emiliana* (Mayer, 1872) and *Persististrombus coronatus* (Defrance, 1827). Younger subunits of the beach-deposits (Fig. 2) consist of smaller sized clasts (small granules to pebbles), and macrofossils are reworked to pebble- to sand-sized bioclasts.

This succession is interpreted to represent initial deposition on a rocky shore-plate, strewn with blocks of eroded basement, that was subsequently inundated by a rapid sea-level rise, allowing finer-grained sediment to settle between the boulders and colonisation by burrowing infauna (basal conglomerate). Finally, adecrease in the rate of sea-level rise resulted in the formation of a pebbly bioclast sand beach (younger subunits).

Based on the occurrence of similar mollusc faunas, Meco and Stearns (1981) and Meco et al. (2007) correlated the Neogene emergent shore-line deposits of western Fuerteventura with similar units at Gran Canaria and Lanzarote islands. Generally, palaeontological evidence and absolute radiometric dating indicate a Late Miocene to Early Pliocene age for these sediments. The radiometric ages obtained by Coello et al. (1992) for the locally underlying lava flows (5.0–5.8 Ma) and the presence of *Nerita emiliana* suggest an Early Pliocene (Zanclean) age for the fossiliferous conglomerate and sandstone at the sampling locality. They are overlain by Pliocene to Holocene alluvial fan deposits and aeolian calcarenites, palaeosoils and soils.

The barnacle material has been collected from the basal conglomerate a few cm above the shore-plate discontinuity surface. The cirripedians are not rare at the locality, but extraction from the matrix is difficult due to the brittle preservation and dense surrounding rock matrix. The barnacle compartments were not attached to a substrate but freely embedded in random orientation in the matrix.

Methods and repository

The specimens have been cleaned from matrix as far as possible given their delicate preservation and photographed. Descriptive terminology follows Newman et al. (1969). The specimens are stored in the invertebrate fossil collection of the Geoscience Centre, University of Göttingen, Germany (GZG.INV.).

Systematic palaeontology

Subclass **Cirripedia** Burmeister, 1834
Superorder **Thoracica** Darwin, 1854
Order **Sessilia** Lamarck, 1818
Suborder **Balanomorpha** Pilsbry, 1916
Superfamily **Coronuloidea** Leach, 1817
Family **Tetraclitidae** Gruvel, 1903
Subfamily **Tetraclitinae** Gruvel, 1903

Genus ***Tesseropora*** Pilsbry, 1916

Tesseropora canariana sp. nov.

Figs. 2–3

Holotype. – GZG.INV.003333 (Figs. 2A–C, 3), complete compartment of adult individual, length: 24 mm, width: 22 mm, height: >21 mm.

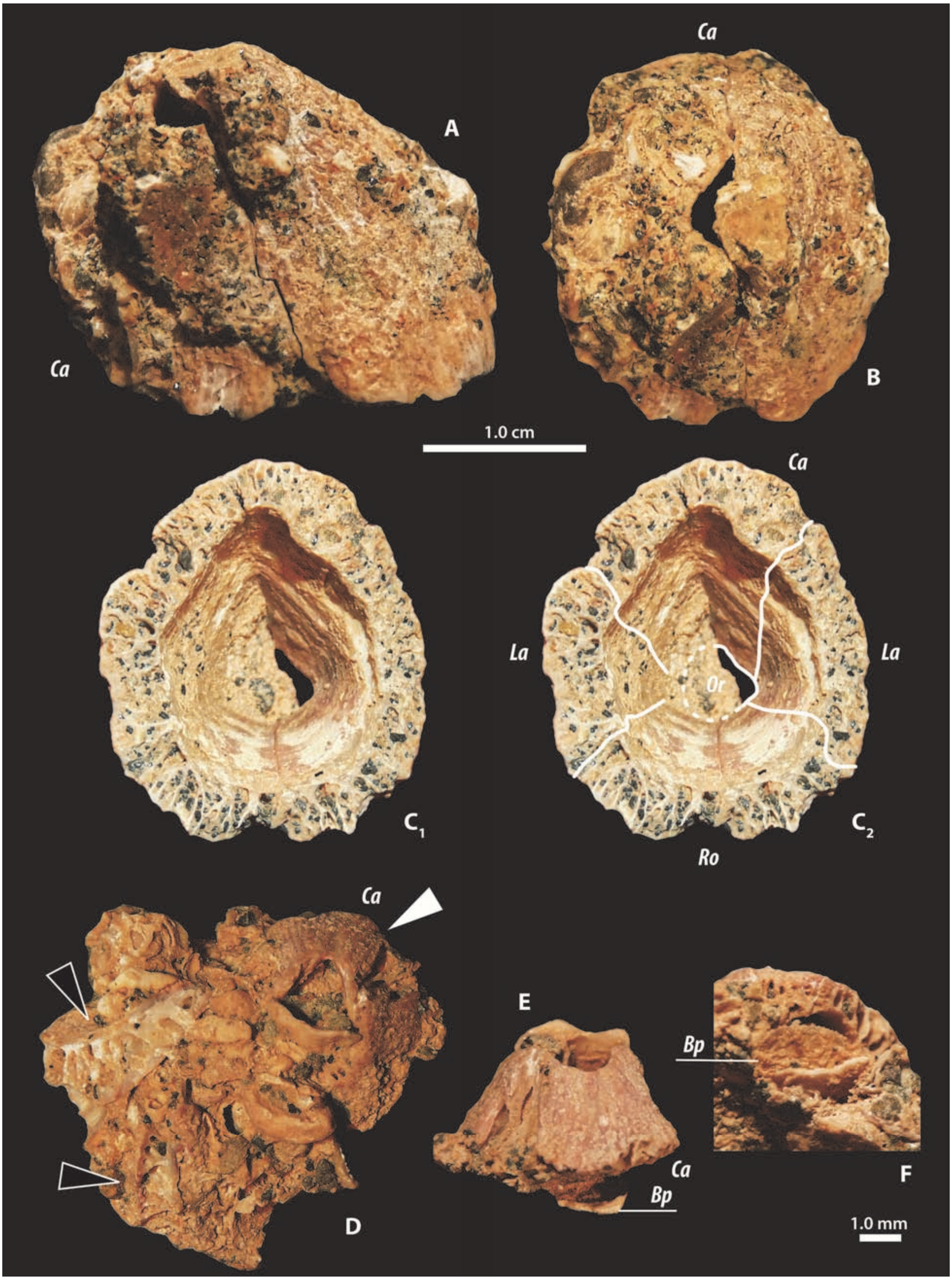

Fig. 2: *Tesseropora canariana* sp. nov., Early Pliocene, western Fuerteventura, Canary Islands, Spain. **(A–C)** GZG.INV.003333, holotype, adult compartment, in **(A)** lateral, **(B)** apical, and **(C)** basal view (C_1 = unlabelled and C_2 = labelled). **(D–F)** GZG.INV.003334, paratype, subadult compartment, **(D)** paratype specimen in apical view (white arrow) with associated compartment fragments of larger specimens (black arrows), **(E)** paratype specimen in lateral view, **(F)** paratype specimen in basal view with fragment of calcareous basal plate. Abbreviations: *Bp*: basal plate, *Ca*: carina, *La*: lateral, *Ro*: rostral, *Or*: orifice. Scale bars: (A–E) = 1.0 cm, (F) = 1.0 mm.

Paratype. – GZG.INV.003334 (Figs. 2D–F), slightly damaged compartment of subadult individual, length: >12 mm, width: ~16 mm, height: >9 mm.

Further material examined. – Compartment fragments in matrix associated to GZG.INV.003334.

Locus typicus. – Punta de la Caleta Mansa, ~1.5 km S of Puerto de la Peña, western Fuerteventura, Canary Islands, Spain.

Stratum typicum. – Unnamed Lower Pliocene (Zanclean) shoreline-deposits, overlying subaerial basalts of the Volcanic Series II (of Fúster et al. 1968).

Etymology. – After the occurrence on the Canary Islands.

Diagnosis. – Only the compartment is known. A large species of *Tesseropora*, showing the following combination of characters: compartment plates robust and rigidly articulating, radii and alae narrow, secondary and tertiary parietal tube rows are present, horizontally striated sheath very well developed, covering the upper ~60–80 % of the parietes and the radii.

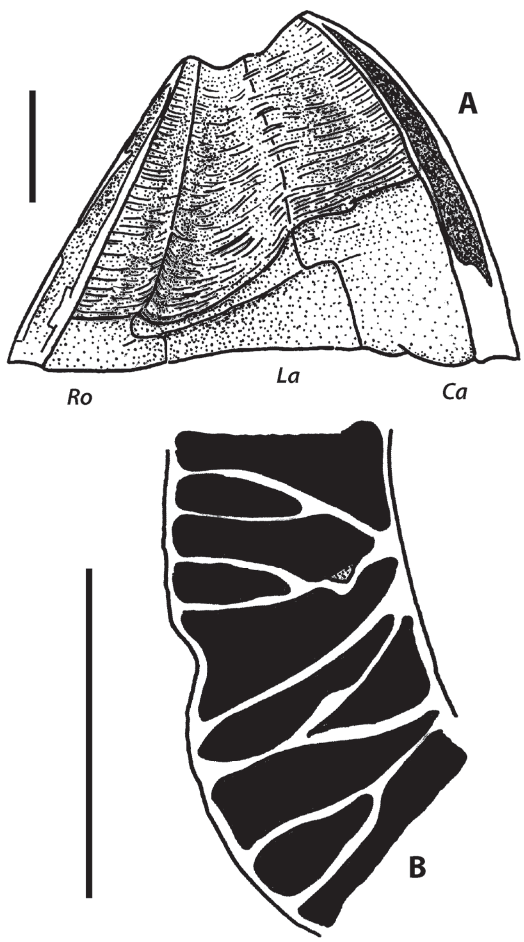

Fig. 3: *Tesseropora canariana* sp. nov., GZG.INV.003333, holotype. **(A)** Longitudinal section through the compartment showing the sheath and radii; **(B)** Detail of compartment wall (rostral) with parietal tubes and intraparietal septals. Abbreviations as in Fig. 2. Scale bars = 5.0 mm.

Description. – A large species with a shell in form of a steep-sided, truncated cone in adult specimen. In subadults, the cone is proportionally lower and wider. The base cross-section of the shell is oval; the side formed by the carina is protruding (Fig. 2C). The compartment plates are very rigidly connected, forming a robust shell. At the outer surface of the compartment, plate sutures are not visible and all known specimens are fully articulated. The outer surface is ornamented with basiapically oriented, coarse, rugged ribs (2–4 per mm). The orifice margin is oval to subpentagonal and enlarged by erosion (Figs. 2A–E).
The inner and outer lamina of the compartment plates are connected by intraparietal septals, which join the smooth inner lamina in normal angle. In large (adult) specimens, the interparietal septals are anastomosing one or two times before contacting the outer lamina, thus forming secondary and eventually tertiary rows of parietal tubes (Fig. 3B). The sheath is closely attached to the inner lamina, extending downwards for ~80 % of the compartment height on the rostral and lateral and to ~60 % on the carina, and shows an ornamentation consisting of faint horizontal striae. Alae and radii are narrow (less than 15 % of the width of the compartment plates to which they attach, Fig. 3A). A calcareous basal plate is present (Figs. 2E–F).

Discussion

The assignment of the barnacles from Fuerteventura to the genus *Tesseropora* Pilsbry, 1916 is based upon the development of the intraparietal septals, joining the inner lamina in normal angles, the development of only 2–3 rows of parietal tubes in large (adult) specimens and the presence of a calcareous basal plate. These features distinguish it from the otherwise similar genus *Tetraclita* Schumacher, 1817 (compare Newman & Ross 1977).

The new species is very similar to *T. dumortieri* (Fischer, 1866) from Miocene deposits of the Rhone Valley and the eastern Atlantic and to *T. sulcata* Carriol, 1993 from the Late Pliocene of the French Atlantic coast. These two species can only be distinguished by details of their opercular valves (Carriol 1993). However, since only the compartment plates of *T. canariana* sp. nov. are known, it can not be compared in this feature. The close relationship to these forms is mainly based on the development of secondary and tertiary parietal tubes, the narrow radii and alae, the solid and compact habitus (sutures of compartment plates can hardly be traced in external view) and the size. It differs from both significantly in the extension and ornamentation of the sheath.

Among the living *Tesseropora* species it shares the development of multiple parietal tube rows with *T. wireni* (Nilsson-Cantell, 1921) (tropical Indopacific), but the latter differs in having wider alae and radii, and is smaller and less rigidly build. From the extant species *T. atlantica* Newman & Ross, 1977 (Bermuda), *T. arnoldi* Young, 1998 (Azores, considered conspecific with *T. atlantica* by Southward 1998, Costa & Jones 2000), *T. rosea* (Krauss, 1848) (southern, temperate Indopacific), and the fossil *T. isseli* (de Alessandri, 1895) (Oligocene, Italy), and *T. unisemita* Zullo, 1968 (Pliocene, Mexico) it differs in the presence of multiple parietal tube rows. However, in *T. arnoldi* the sheath is very similar to *T. canariana* sp. nov.

Recent identifications of *T. dumortieri* from the "Faluns de Touraine" (Carriol 2005, 2008) showed that populations of this genus entered the Atlantic Ocean from the Mediterranean as early as during the Middle Miocene. In the present-day Atlantic barnacle fauna, *Tesseropora* is represented only by isolated, island-bound occurrences (Bahamas, Madeira, Azores, Saint Paul's Rock; Newman & Ross 1977; Edwards & Lubbock 1983; Young 1998; Wirtz et al. 2006). Probably *T. canariana* sp. nov. represents an early case of insular endemism similar to those of other Atlantic archipelagos. Cardigos et al. (2006) have proposed an anthropogenic introduction of the extant *T. atlantica* (?=*T. arnoldi*) to the Azores, based upon a very short larval dispersal phase of this species. However, Winkelmann et al. (2010) argued for a natural dispersion and this is supported by *T. canariana* sp. nov. from Fuerteventura, showing transatlantic insular occurrence as early as Pliocene. The Neogene populations from the European shore regions (*T. sulcata*) and Fuerteventura apparently became extinct since the Pliocene, most probably due to the decrease of water temperature towards the end of the Pliocene.

The new species from western Fuerteventura lived in the high energy, well oxygenated, shore-line or shore-face zone of a rocky shore. Dispersed embedding in the matrix and the preservation of a calcareous basal plate in the paratype suggests epiphytical colonisation, e.g., on thallophytes. The good quality of preservation precludes a long transport distance, and the robustness of the shell suggests a substrate in a high-energy environment. This is consistent with the habitat of extant species of this genus (Denley & Underwood 1979; Anderson & Anderson 1985). The abundant presence of the gastropod *Persististrombus coronatus* and other molluscs indicates warm water temperatures, with minimum sea surface temperatures not falling below 15–16°C (Meco 1977, Harzhauser & Kronenberg 2013).

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References

Anderson, D. T. & Anderson, J. T. (1985): Functional morphology of the balanomorph barnacles *Tesseropora rosea* (Krauss) and *Tetraclitella purpurascens* (Wood) (Tetraclitidae). *Australian Journal of Marine and Freshwater Research* **36** (1): 87-113. http://dx.doi.org/10.1071/MF9850087

Balogh, K.; Ahijado, A.; Casillas, R. & Fernandez, C. (1999): Contributions to the chronology of the Basal Complex of Fuerteventura, Canary Islands. *Journal of Volcanology and Geothermal Research* **90** (1-2): 81-101. http://dx.doi.org/10.1016/S0377-0273(99)00008-6

Bruguière, M. (1789): *Encyclopédie méthodique, ... Histoire naturelle des vers. Tome **1** (1).* Paris (Panckoucke): 344 pp.

Burmeister, C. H. (1834): *Beiträge zur Naturgeschichte der Rankenfüsser (Cirripedia).* Berlin (C. Reimer): viii + 60 pp.

Cardigos, F.; Tempera, F.; Ávila, S. P.; Gonçalves, J.; Colaço, A. & Santos, R. S. (2006): Non-indigenous marine species of the Azores. *Helgoland Marine Research* **60** (2): 160-169. http://dx.doi.org/10.1007/s10152-006-0034-7

Carriol, R.-P. (1993): *Tesseropora* (Cirripedia, Thoracica) du Néogène de France. *Geobios* **26** (6): 709-713. http://dx.doi.org/10.1016/S0016-6995(93)80052-S

Carriol, R.-P. (2005): Re-examination and new species of Cirripeds (Thoracica, Tetraclitidae, and Balanidae) from the Middle Miocene of the faluns de Touraine (France). *Annales de Paléontologie* **91** (1): 117-126. http://dx.doi.org/10.1016/j.annpal.2004.11.002

Carriol, R.-P. (2008): New genus and new species of Cirripedia (Chthamalidae, Tetraclitidae, Archaeobalanidae and Balanidae) from the Middle Miocene of the faluns of Touraine (France). *Zootaxa* **1675**: 31-48.

Coello, J.; Cantagrel, J. M.; Hernán, F.; Fúster, J. M.; Ibarrola, E.; Ancochea, E.; Casquet, C.; Jamond, C.; Díaz de Téran, J.-R. & Cendrero, A. (1992): Evolution of the eastern volcanic ridge of the Canary Islands based on new K-Ar data. *Journal of Volcanology and Geothermal Research* **53**: 251-274. http://dx.doi.org/10.1016/0377-0273(92)90085-R

Costa, A. C. & Jones, M. B. (2000): The genus *Tesseropora* (Cirripedia: Tetraclitidae) from São Miguel, Azores. *Arquipélago. Life and Marine Sciences, Suppl.* **2** (A): 71-78.

Darwin, C. (1854): *A Monograph on the Fossil Balanidæ and Verrucidæ of Great Britain.* London (The Palaeontographical Society): 44 pp.

De Alessandri, G. (1895): Contribuzione allo studio dei Cirripedia fossili d'Italia. *Società Geologica Italiana, Bolletino* **13**: 234-314.

Defrance, J. L. M. (1827): *Dictionnaire des sciences naturelles, **51**.* Paris (Levrault & Normat): 534 pp.

Denley, E. J. & Underwood, A. J. (1979): Experiments on factors influencing settlement, survival and growth of two species of barnacles in New South Wales. *Journal of Experimental Marine Biology and Ecology* **36**: 269-294. http://dx.doi.org/10.1016/0022-0981(79)90122-9

Edwards, A. & Lubbock, R. (1983): The ecology of Saint Paul's Rock (equatorial Atlantic). *Journal of Zoology* **200**: 51-69. http://dx.doi.org/10.1111/j.1469-7998.1983.tb06108.x

Epibiont Research Cooperative (2007): A Synopsis of the Literature on the Turtle Barnacles (Cirripedia: Balanomorpha: Coronuloidea) 1758-2007. *Epibiont Research Cooperative, Special Publication* **1**: 1-62.

Fischer, P. (1866): Note E. Description des nouvelles espèces d'invertébrés fossiles dans les bassin du Rhône, (formation tertiaire moyenne). In: Falsan, A. & Locard, A. (eds.): *Monographie Géologique du Mont-d'Or Lyonnais et ses dépendances.* Lyon (Pitrar Ainé): 434-440.

Fúster, J. M.; Cendrero, A.; Gastesi, P. & Lopez Ruiz, J. (1968): *Geología y vulcanología de las Islas Canarias. Fuerteventura.* Madrid (Inst. "Lucas Mallada"): 239 pp.

Fúster, J. M.; Barrera, J. L.; Muñoz, M.; Sagredo, J. & Yebenes, A. (1984): *Mapa geologica de Espagna (1 : 25 000). 1106/III Pajara.* Madrid (Instituto Geologico y Minero de Espagna): 61 pp.

Gruvel, A. (1903): Révision des Cirrhipèdes appartenant à la collection du Muséum d'Histoire Naturelle. Operculés. I. Partie systématique. *Nouvelles Archives du Muséum d'Histoire Naturelle (sér. 4)* **5**: 95-170.

Harzhauser, M. & Kronenberg, G. C. (2013): The Neogene strombid gastropod *Persististrombus* in the Paratethys Sea. *Acta Palaeontologica Polonica* **58** (4): 785-802.

Krauss, F. (1848): *Die südafrikanischen Mollusken; ein Beitrag zur Kenntniss der Mollusken des Kap- und Natallandes und zur geographischen Verbreitung derselben, mit Beschreibung und Abbildung der neuen Arten.* Stuttgart (Ebner & Seubert): 134 pp.

Lamarck, J. B. de (1818): *Histoire naturelle des animaux sans vertèbres. Tome **V**.* Paris (Deterville & Verdière): 612 pp.

Leach, W. E. (1817): *The Zoological Miscellany, being descriptions of new or interesting animals. Vol. 3.* London (B. McMillan): 157 pp.

LeBas, M. J.; Rex, D. C. & Stillman, C. J. (1986): The early magmatic history of Fuerteventura, Canary Islands. *Geological Magazine* **123**: 287-298. http://dx.doi.org/10.1017/S0016756800034762

Mayer, M. C. (1872): Description des Coquilles fossiles des terraines tertiaires supérieurs (suite). *Journal de Conchyliologie (sér. 3)* **20** (12): 227-238.

Meco, J. (1977): *Paleontologia de Canarias I: Los "*Strombus*" neógenos y cuaternarios del Atlántico euroafricano.* Gran Canaria (Ediciones des Excmo, Cabildo Insular de Gran Canaria): 92 pp.

Meco, J & Pomel, R. (1985). Les formations marines et continentales intervolcaniques des Iles Canariens Orientales, Grand Canarie, Fuerteventura et Lanzarote; stratigraphie et signification paleoclimatique. *Estudios Geológicos* **41**: 223-227.

Meco, J. & Stearns, C. E. (1981): Emergent Littoral Deposits in the Eastern Canary Islands. *Quarternary Research* **15** (2): 199-208. http://dx.doi.org/10.1016/0033-5894(81)90104-6

Meco, J.; Scaillet, S.; Gouillou, H.; Lomoschitz, A.; Carracedo, J. C.; Ballester, J.; Betancort, J.-F. & Cilleros, A. (2007): Evidence for long-term uplift on the Canary Island from emergent Mio-Pliocene littoral deposits. *Global and Planetary Change* **57** (3-4): 222-234. http://dx.doi.org/10.1016/j.gloplacha.2006.11.040

Newman, W. A. & Ross, A. (1977): A living *Tesseropora* (Cirripedia; Balanomorpha) from Bermuda and the Azores, first records from the Atlantic since the Oligocene. *Transactions of the San Diego Natural History Museum* **18** (12): 207-216.

Newman, W. A.; Zullo, W. A. & Withers, T. H. (1969): Cirripedia. In: Moore, R. C. (ed.): *Treatise on Invertebrate Paleontology, Part R, Arthropoda 4, Volume 1.* Boulder, Colo. (The Geological Society of America) & Lawrence, Kans. (University of Kansas): R206-R294.

Nilsson-Cantell, C. A. (1921): Cirripedien-Studien. Zur Kenntnis der Biologie, Anatomie und Systematik dieser Gruppe. *Zoologiska Bidrag från Uppsala* **7**: 75-395.

Pilsbry, H. A. (1916): The sessile barnacles (Cirripedia) contained in the collections of the U.S. National Museum; including a monograph of the American species. *Bulletin of the United States National Museum* **93**: 1-366.

Rona, A. & Nawalk, A. J. (1970): Post-early Pliocene unconformity on Fuerteventura, Canary Islands. *Bulletin of the Geological Society of America* **81**: 2117-2122. http://dx.doi.org/10.1130/0016-7606(1970)81[2117:PPUOFC]2.0.CO;2

Ross, A. & Frick, M. G. (2007): Systematics of the coronuloid barnacles. *Epibiont Research Cooperative, Special Publication* **1**: 23-29.

Rothpletz, A. & Simonelli, V. (1890): Die marinen Ablagerungen auf Gran Canaria. *Zeitschrift der Deutschen Geologischen Gesellschaft* **42**: 677-737.

Schumacher, C. F. (1817): *Essai d'un nouveau système des habitations des vers testacés.* Copenhague (Schultz): 287 pp.

Southward, A. (1998): Notes on Cirripedia of the Azores Region. *Arquipélago, Life and Marine Sciences* **16** (A): 11-27.

Stillman, C. J. (1999): Giant Miocene landslides and the evolution of Fuerteventura, Canary Islands. *Journal of Volcanology and Geothermal Research* **94** (1-4): 89-104. http://dx.doi.org/10.1016/S0377-0273(99)00099-2

Winkelmann, K.; Buckeridge, J. S.; Costa, A. C.; Manso Dionísio, M. A.; Medeiros, A.; Cachão, M. & Ávila, S. P. (2010): *Zullobalanus santamariaensis* sp. nov., a new late Miocene barnacle species of the family Archaeobalanidae (Cirripedia: Thoracica), from the Azores. *Zootaxa* **2680**: 33-44.

Wirtz, P.; Araújo, R. & Southward, A. (2006): Cirripedia of Madeira. *Helgoland Marine Research* **60** (3): 207-212. http://dx.doi.org/10.1007/s10152-006-0036-5

Young, P. S. (1998) Cirripedia (Crustacea) from the "Campagne Biaçores" in the Azores region, including a generic revision of the Verrucidae. *Zoosystema* **20** (1): 31-92.

Zullo, V. A. (1968): *Tesseropora* Pilsbry (Cirripedia, Thoracica) from the Pliocene of the Gulf of California. *Crustaceana* **15** (3): 272-274.

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http://dx.doi.org/10.3249/webdoc-3928