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Annotations to the figured scallops (Mollusca, Bivalvia, Pectinidae) in Gualtieri's "Index Testarum Conchyliorum", deposited in the Museo di Storia Naturale e del Territorio at Calci (Pisa, Italy)

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INTRODUCTION

An overview is given of the Pectinidae types present in the Gualtieri collection. In Gualtieri (1742) 46 figures (pl. 73 - 15 figs, pl. 74 - 25 figs, pl. 98 - 2 figs, and pl. 99 - 4 figs) show specimens of Pectinidae. Linnaeus (1758) referred to 10 Pectinidae species figured by Gualtieri. Of these, 8 species (7 paratypes and one syntype, herein recognised) were traced in the Gualtieri collection, and 2 species (*Ostrea pleslutrae* and *Ostrea maxima*) were not found. Subsequently, Gmelin (1791) referred to 33 Pectinidae species (12 described by Linnaeus in 1758, one species described by Müller in 1776), and 20 species (13 species were traced, all herein recognised as syntypes, and 7 species were not found) named by himself. No direct evidence was found of Rumphius' Pectinidae specimens in the Gualtieri collection.

New junior synonyms are *Ostrea fasciata* Linnaeus, 1758 = *Ostrea glabra* Linnaeus, 1758, *Ostrea plana* Gmelin, 1791 = *Ostrea opercularis* Linnaeus, 1758, *Ostrea media* Gmelin, 1791 = *Ostrea varia* Linnaeus, 1758, *Ostrea florida* Gmelin, 1791 = *Ostrea opercularis* Linnaeus, 1758, *Ostrea incarnata* Gmelin, 1791 = *Ostrea opercularis* Linnaeus, 1758, and two new senior synonyms: *O. punctata* Gmelin, 1791 = *Pecten lentiginosus* Reeve, 1853 and *Ostrea depressa* Gmelin, 1791 = *Ostrea flexuosa* Poli, 1795. The junior synonyms are retained as the valid names.

Key words: Bivalvia, Pectinidae, types, synonyms, Linnaeus, Gmelin, Gualtieri, Rumphius.

In November 1990 the late Dr. Henry E. Coomans, his assistant Robert G. Moolenbeek (formerly of Zoological Museum Amsterdam, now in Naturalis Biodiversity Center) and I visited the Museo di Storia Naturale e del Territorio of the University of Pisa (= MNSP), housed in the Carthusian monastery at Calci (Certosa di Calci) (Martini, 1977), founded in 1366. We wished to look for documents of G.E. Rumphius in the library of the University of Pisa, and for any molluscan specimens sent by him to Cosimo III, and partly donated by the grand duke of Tuscany to N. Gualtieri for his private "naturalia" collection, now deposited in the MSNP. A second goal was to look for type material of the Conidae and Pectinidae preserved in the collection of Gualtieri and figured in Gualtieri's "Index Testarum Conchyliorum [...]" (1742).

During our visit in 1990 the Gualtieri collection was in complete disarray due to the reconstruction of the monastery and museum collections. Some figured specimens were already selected and temporarily placed in show-cases, but other displaced material was stored in monk's cells and in complete disorder. I have traced and selected pectinid specimens that correspond in size to the figures in Gualtieri's work. All the selected specimens have an old ink number on the inside of the shell, similar to the numbers of the figures. Several old labels were found associated with these figured specimens, but these labels were added to the material in the 19th century, after the publication of Lamarck's "Histoire naturelle des Animaux sans

Vertèbres ..." (1819), based on Lamarck's species names, which appear on the labels. Original labels by Gualtieri were not found.

NICCOLÒ GUALTIERI (1688-1744)

Niccolò Gualtieri (Fig. 1) was born in Florence on 9 July 1688. At 20 years of age Niccolò moved to Pisa where he graduated in philosophy and medicine under the supervision of Giuseppe Zambeccari (1665–1728). Once back in Florence he practiced medicine, becoming Violante di Baviera's (1673–1731) personal physician. He was subsequently deputy physician of Cosimo III d' Medici (1642–1723), the sixth Grand Duke of Tuscany, and his successor Giovanni Gastone d' Medici (1671–1737). After Gastone's death, Gualtieri lost his position of archiater, but became professor at the University of Pisa.

Gualtieri began to gather material for a private museum of natural history in 1731. As a physician he spent a period on Elba in the Tuscan Archipelago, where he collected a lot of minerals, fossils and shells. The Duke of Tuscany was a keen collector of natural objects and he also obtained many tropical marine molluscan species from Rumphius (Martelli, 1903). Duplicates were given to Gualtieri for his private museum. Gualtieri died in Florence on 15 February 1744 and was buried in the Chiesa de Padri del Carmine. Gualtieri's collections are still extant and deposited in the Museo di Storio Naturale e del Territorio of the University of Pisa of the Certosa di Calci, a former Carthusian monastery (Dance, 1986; Manganelli & Benocci, 2011; Tomasi, 1988).

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FIGURED TYPE PECTINID SPECIMENS IN GUALTIERI'S "INDEX ..." (1742) (FIGS 2-4)

Type material preserved in the Gualtieri collection (MSNP), according to the ICZN (1999: 76, art. 72.4.1), comprise the type series of a nominal species-group by direct or indirect (bibliographic references) indication of the type specimen(s). Linnaeus (1758) and Gmelin (1791) both referred to illustrations in Gualtieri's "Index ..." (1742) as illustrations of their species, hence the specimens figured by Gualtieri are treated as types, in this case as paralectotypes of Linnaeus's pectinid species, syntypes of Linnaeus not found in Linnaeus's collection (see Dijkstra, 1999), or as syntypes of Gmelin's species.

Ostrea pleuronectes Linnaeus, 1758 (Fig. 5)

Rumphius, 1705: pl. 45 figs A, B.

Buonnani, 1709: Class. II, nr. 108.

Gualtieri, 1742: pl. 73 fig. B [text and figure].



Fig. 1. Portrait of Gualtieri (1735). Universiteitsbibliotheek Amsterdam (UvA) Bijzondere Collecties (AB Legkast 069-002).

Ostrea pleuronectes Linnaeus, 1758: 696, no. 159; Gmelin, 1791:

3317, nr. 6; Dijkstra, 1999: 399, fig. 1C-F.

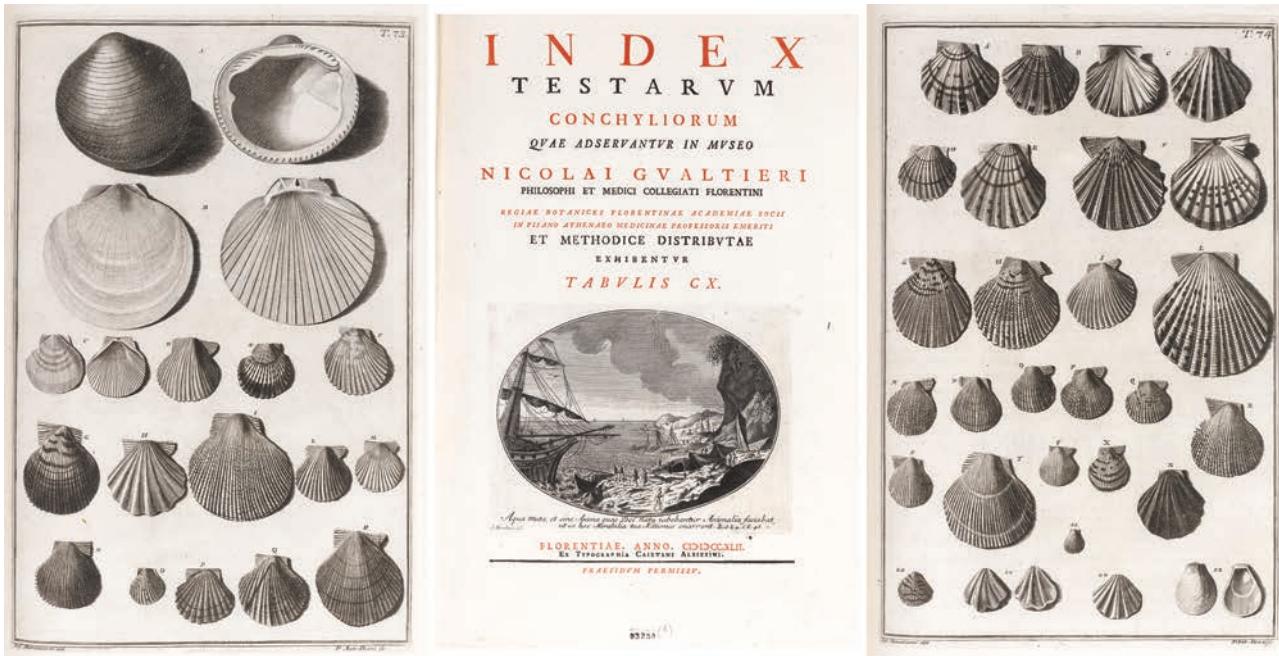
Amusium pleuronectes; Dijkstra, 2013: 50, pl. 11 fig. 4a-b, pl. 13 fig. 1a-d

Gualtieri's description (pl. 73 fig. B). — "Pecten Tenuis, admodum complanatus, five compressus, fragilis, pellucidus, striatus striis in dorso veluti lineis a cardine ad circumferentiam diffusis, interne vero striis rarioribus aequidistantibus, in plano aequali, aequilatero eminentibus. Pars externa zizyphino colore rubescit; interna vero est candida, aliquando utraque pars lactea."

Type material. — Paralectotype (MSNP G. 2257), left valve (H 85 mm, L 83.1 mm). The dimensions of the left valve fit the specimen figured by Gualtieri (T. 73 fig. B).

Remarks. — Figure B of plate 73 consists of two figures, i.e., exterior and interior of the same left valve.

An additional unfigured left valve (H 69.9 mm, L 68.9 mm) was also traced, but does not belong to the type series.



Figs 2-4. Gualtieri's "Index Testarum Conchyliorum" (1742). 2 (left), Plate 73; 3 (center), Frontispiece; 4 (right), Plate 74.
Universiteitsbibliotheek Amsterdam (UvA) Bijzondere Collecties (AB Legkast 069-001).

For type data, synonyms, additional references, description and distribution of the present species see Dijkstra (1999: 399; 2013: 50). The current combination for the present species is *Amusium pleuronectes* (Linnaeus, 1758).

Ostrea obliterata Linnaeus, 1758 (Fig. 6)

Gualtieri, 1742: pl. 73 fig. C [text and figure].

Ostrea obliterata Linnaeus, 1758: 697, nr. 160; Gmelin, 1791: 3323, nr. 46; Dijkstra, 1999: 400, fig. 9A-B.

Dentamussium obliteratum; Dijkstra, 2013: 54, pl. 14 fig. 1a-d, pl. 16 fig. 4a-b.

Gualtieri's description (pl. 73 fig. C). — "Pecten Tenuis, complanatus in dorso lineis minutissimus, & densissimis a cardine ad oram, nonnullisque aliis cicularibus signatus, interne minutissime striatus striis eminentibus, phoeniceo colore splendide lucescens."

Type material. — Paralectotype (MSNP G. 2258), left valve (H 33.5, L 32 mm). The dimensions of the left valve fit the specimen figured by Gualtieri (pl. 73 fig. C).

Remarks. — Linnaeus (1758) incorrectly referred to Gualtieri's figure pl. 73 fig. G [sic], and subsequently (1764, 1767) to the correct figure, pl. 73 fig. C. Figure C of plate 73 consists of two figures, i.e., exterior and interior of the same left valve.

For type data, synonyms, additional references, description and distribution of the present species see Dijkstra (1999: 400; 2013: 54). The current combination for the present species is *Dentamussium obliteratum* (Linnaeus, 1758).

Ostrea glabra Linnaeus, 1758 (Figs 8, 12, 13)

Gualtieri, 1742: pl. 73 fig. H [text and figure].

Ostrea glabra Linnaeus, 1758: 698, nr. 170; Gmelin, 1791: 3324, nr. 50; Dijkstra, 1999: 419, fig. 10A-B.

Flexopecten glaber; Raines & Poppe, 2006: 114, pl. 60 figs 1-7, pl. 61 figs 1-6, pl. 62 figs 1-8, pl. 63 figs 1-8, pl. 64 figs 1-7, pl. 65 figs 1-8, pl. 66 figs 1-8.

Gualtieri's description (pl. 73 fig. H). — "Pecten Tenuis, striis crassis, latis, rotundis, & rariss distinctus, totus candidus."

Type material. — Paralectotype (MSNP G. 2263), right valve (H 41 mm, L 43 mm). The dimensions of the right valve fit the specimen figured by Gualtieri (pl. 73 fig. H).

Remarks. — A left valve of *Ostrea glabra* (H 39.5 mm, L 41 mm) figured by Gualtieri (pl. 74 fig. B) registered (MSNP G. 2264.2), and another left valve (H 39.1 mm, L 38.9 mm) also figured by Gualtieri (pl. 74, fig. C), registered (MSNP G. 2264.1), do not belong to the type series, because Linnaeus (1758: 698) only referred to Gualtieri's figure pl. 73 fig. H. Three additional figured specimens of *O. glabra* referred to by Gmelin (pl. 74 figs A, D, Z) do not belong to the type series.

For type data, synonyms, additional references, description and distribution of the present species see Dijkstra (1999: 419). The current combination for the present species is *Flexopecten glaber* (Linnaeus, 1758).

Ostrea fasciata Linnaeus, 1758 (Fig. 15)

Gualtieri, 1742: pl. 74 fig. E [text and figure].

Ostrea glabra Linnaeus, 1758: 698, nr. 170; Gmelin, 1791: 3324, nr. 50.

Ostrea fasciata Linnaeus, 1758: 699, nr. 174.

Gualtieri's description (pl. 74 fig. E). — "Pecten Tenuis, striatus striis latis, ex fusco ferrugineus, pullo colore fasciatim maculatus, & lineatus."

Type material. — Syntype (MSNP G. 2269), left valve (H 46.4 mm, L 46.9 mm). The dimensions of the present left valve fit the specimen figured by Gualtieri (pl. 74 fig. E).

Remarks. — *Ostrea fasciata* Linnaeus, 1758, is herein a new subjective junior synonym of *Ostrea glabra* Linnaeus, 1758. As first reviser, the author selects the name *Ostrea glabra* as the senior synonym of the two synonyms proposed simultaneously by Linnaeus (1758), *Ostrea glabra* and *Ostrea fasciata*. It is likely that further type series specimens of *O. fasciata* are present in the collections of the Zoological Museum of the University of Uppsala and/or in the Linnean Society of London in Burlington House (Dijkstra, 1999), but are currently determined as *Ostrea glabra*.

For type data, synonyms, additional references, description and distribution of the present species see Dijkstra (1999: 420). The current combination for the present species is *Flexopecten glaber* (Linnaeus, 1758).

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Ostrea pallium Linnaeus, 1758 (Fig. 16)

Gualtieri, 1742: pl. 74 fig. [text and figure].

Ostrea pallium Linnaeus, 1758: 697, nr. 163; Gmelin, 1791: 3322, nr. 40; Dijkstra, 1999: 405, figs 2E-F, 3A-B.

Gloripallium pallium; Dijkstra, 2013: 42, pl. 10 fig. 3a-d, pl. 27 fig. 1a-b.

Gualtieri's description (pl. 74 fig. F). — "Pecten Tenuis, ipsis latis striis striatis, & minutissime granulatis distinctus, rubicundus, maculis atro-purpureis aspersus, circa cardinem candidissimus, & notulis piceis eleganter virgulatus, interne candidus, & in margine croceo colore depictus."

Type material. — Paralectotype (MSNP G. 2268), an articulated specimen (H 49.1 mm, L 49.1 mm, D 16.9 mm). Left valve only figured, the exterior and interior. The dimensions of the articulated valves fit the left valve figured by Gualtieri (pl. 74 fig. F).

Remarks. — For type data, synonyms, additional references, description and distribution of the present species see Dijkstra (1999: 405; 2013: 42). The current combination for the present species is *Gloripallium pallium* (Linnaeus, 1758).

Ostrea sanguinea Linnaeus, 1758 (Fig. 19)

Gualtieri, 1742: pl. 74 fig. N [text and figure].

Ostrea sanguinea Linnaeus, 1758: 698, nr. 167; Gmelin, 1791: 3323:

nr. 47; Dijkstra, 1999: 413, fig. 4A-B.

Mimachlamys sanguinea; Dijkstra, 2013: 96, pl. 24 fig. 2a-d, pl. 32 fig. 4a-b.

Gualtieri's description (pl. 74 fig. N). — "Pectunculus, uno striarum ordine alteri superposito, ex rubro croceus, vel ex piceo nigricans."

Type material. — Paralectotype (MSNP G. 2271), left valve (H 30 mm, L 26 mm). The dimensions fit the left valve figured by Gualtieri (pl. 74 fig. N).

Remarks. — For type data, synonyms, additional references, description and distribution of the present species see Dijkstra (1999: 413; 2013: 96). The current combination for the present species is *Mimachlamys sanguinea* (Linnaeus, 1758).

Ostrea varia Linnaeus, 1758 (Figs 7, 10, 22)

Gualtieri, 1742: pl. 74 fig. R [text and figure].

Ostrea varia Linnaeus, 1758: 698, nr. 168; Gmelin, 1791: 3324, nr.

48; Dijkstra, 1999: 416.

Mimachlamys varia; Raines & Poppe, 2006: 276, pl. 229 figs 1-6, pl. 230 figs 1-7, pl. 231 figs 1-3, pl. 292 fig. 3.

Gualtieri's description (pl. 74 fig. R). — "Pectunculus, striis acutis muricibus exasperatus, croceus."

Type material. — Paralectotype (MSNP G. 2272), left valve (H 41.8 mm, L 39 mm). The dimensions fit the left valve figured by Gualtieri (pl. 74 fig. R).

Remarks. — Gmelin (1791: 3324) also referred to Gualtieri's figures (pl. 73 figs G and N). Both specimens are traced (MSNP G. 2259 and MSNP G. 2261) in Gualtieri's collection, but these specimens are not belonging to the type series.

For type data, synonyms, additional references, description and distribution of the present species see Dijkstra (1999: 415).

The current combination of the present species is *Mimachlamys varia* (Linnaeus, 1758).

Ostrea jacobaea Linnaeus, 1758 (Figs 27, 28)

Gualtieri, 1742: pl. 99 fig. B [text and figure].

Ostrea jacobaea Linnaeus, 1758: 696, nr. 155; Gmelin, 1791: 3316, nr. 2; Dijkstra, 1999: 392, fig. 8B.

Pecten jacobaeus; Raines & Poppe, 2006: 150, pl. 96 figs 1-3, pl. 97 figs 1-3, pl. 98, figs 1-3, pl. 292 fig. 2.

Gualtieri's description (pl. 99 fig. B). — "Concha Pectinata eadem, sed striis magis profunde striatis, seu magis canaliculatis distincta, candidissima. (*Mem. de l'Accad. 1709. pag. 520.*)"

Type material. — Paralectotype (MSNP G. 2384), right valve (H 76 mm, L 88 mm). The dimensions fit

the right valve figured by Gaultieri (pl. 99 fig. B).

Remarks. — A left valve of *Ostrea jacobaea* figured by Gaultieri (pl. 99, fig. A), incorrectly determined by Gmelin (1791) as “*O. maximus*”, was not referred to by Linnaeus (1758: 696) and therefore is not part of the type series.

For type data, synonyms, additional references, description and distribution of the present species see Dijkstra (1999: 392). The current combination of the present species is *Pecten jacobaeus* (Linnaeus, 1758).

Ostrea nodosa Linnaeus, 1758 (Fig. 29)

Rumphius, 1709: pl. 48 figs 7-8.

Gaultieri, 1742: pl. 99 figs C, D [text and figure].

Ostrea nodosa Linnaeus, 1758: 697, no. 164; Gmelin, 1791: 3322, nr. 43;

Dijkstra, 1999: 407, fig. 8E.

Nodipecten nodosus; Raines & Poppe, 2006: 218, pl. 161 fig. 2, pl. 162 figs 1-3, pl. 163 fig. 2, pl. 164 figs 1-5, pl. 165 figs 1-6.

Gaultieri's description (pl. 99 fig. C). — “Concha Pectinata, cuius striae sunt latissimae, & ab aliis striis minutissimus undatim striatae; in unaquaque maiori stria nonnullae plicatura, seu pulvilli gibbosi eminent, & intumescunt: purpureo colore quadam candida pulvere asperso nitidissime depicta, intus ex argenteo purpurascens. (*Rumph. Tab. XLVIII. num. 8.*)”

Gaultieri's description (pl. 99 fig. D). — “Concha Pectinata, eadem, eius vero pulvilli sunt magis elati: tota est splendide crocea, intus ex sulvido-argentea. (*Rumph. Tab. XLVIII. num. 7.*). Hae duae Conchae minus sunt convexae quam praecedentes, & cum aliam partem illarum planam nondum viderim, idcirco heic delinacatam non exhibui.”

Type material. — Paralectotype (MSNP G. 2385), right valve (H 103 mm, L 111.5 mm). The dimensions fit the right valve figured by Gaultieri (pl. 99 fig. C). Paralectotype (MSNP G. 2386), right valve (H 92.2 mm, L 94 mm). The dimensions correspond with the right valve figured by Gaultieri (pl. 99 fig. D).

Remarks. — For type data, synonyms, additional references, description and distribution of the present species see Dijkstra (1999: 407). The current combination of the present species is *Nodipecten nodosus* (Linnaeus, 1758).

Ostrea tenuis Gmelin, 1791

Gaultieri, 1742: pl. 73 fig. C [text and figure].

Ostrea oblitterata Linnaeus, 1758: 697, nr. 160; Gmelin, 1791: 3323, nr. 46; Dijkstra, 1999: 400, fig. 9A, B.

Ostrea tenuis Gmelin, 1791: 3320, nr. 23.

Gaultieri's description (pl. 73 fig. C). — See *Ostrea*

oblitterata Linnaeus, 1758.

Type material. — Syntype (MSNP G. 2258), left valve (H 33.5, L 32 mm). The dimensions of the left valve fit the specimen figured by Gaultieri (pl. 73 fig. C).

Remarks. — *Ostrea tenuis* Gmelin, 1791, is an objective junior synonym of *Ostrea oblitterata* Linnaeus, 1758. Both authors referred to Gaultieri's pl. 73, fig. C (see also Dijkstra, 1999: 400). It is herein a new synonym.

For type data, synonyms, additional references, description and distribution of the present species see Dijkstra (1999: 400). The current combination of the present species is *Dentamussium oblitteratum* (Linnaeus, 1758).

Ostrea muricata Gmelin, 1791 (Fig. 9)

Gaultieri, 1742: pl. 73 fig. I [text and figure].

Ostrea varia Linnaeus, 1758: 698, nr. 168; Gmelin, 1791: 3324, nr.

48; Dijkstra, 1999: 415, fig. 5A-D.

Ostrea muricata Gmelin, 1791: 3320, nr. 25.

Gaultieri's description (pl. 73 fig. I). — “Pecten Tenuis, striatus striis rotundis minutissime, & acutissime muricatis, ex subalbido croceus.”

Type material. — Syntype (MSNP G. 2256), left valve (H. 60.8 mm, L 59.5 mm). The dimensions fit the specimen figured by Gaultieri (pl. 73 fig. I).

Remarks. — The present figured left valve is similar in all morphological characters to the type material of *Ostrea varia* Linnaeus, 1758. *Ostrea muricata* Gmelin is a subjective junior synonym of *O. varia*.

For type data, synonyms, additional references, description and distribution of the present species see Dijkstra (1999: 415). The current status of the present species is *Mimachlamys varia* (Linnaeus, 1758).

Ostrea radiata Gmelin, 1791 (Fig. 11)

Gaultieri, 1742: pl. 73 fig. Q [text and figure].

Ostrea opercularis Linnaeus, 1758: 698, nr. 171; Gmelin, 1791: 3325, nr. 51; Dijkstra, 1999: 421, fig. 7A-D.

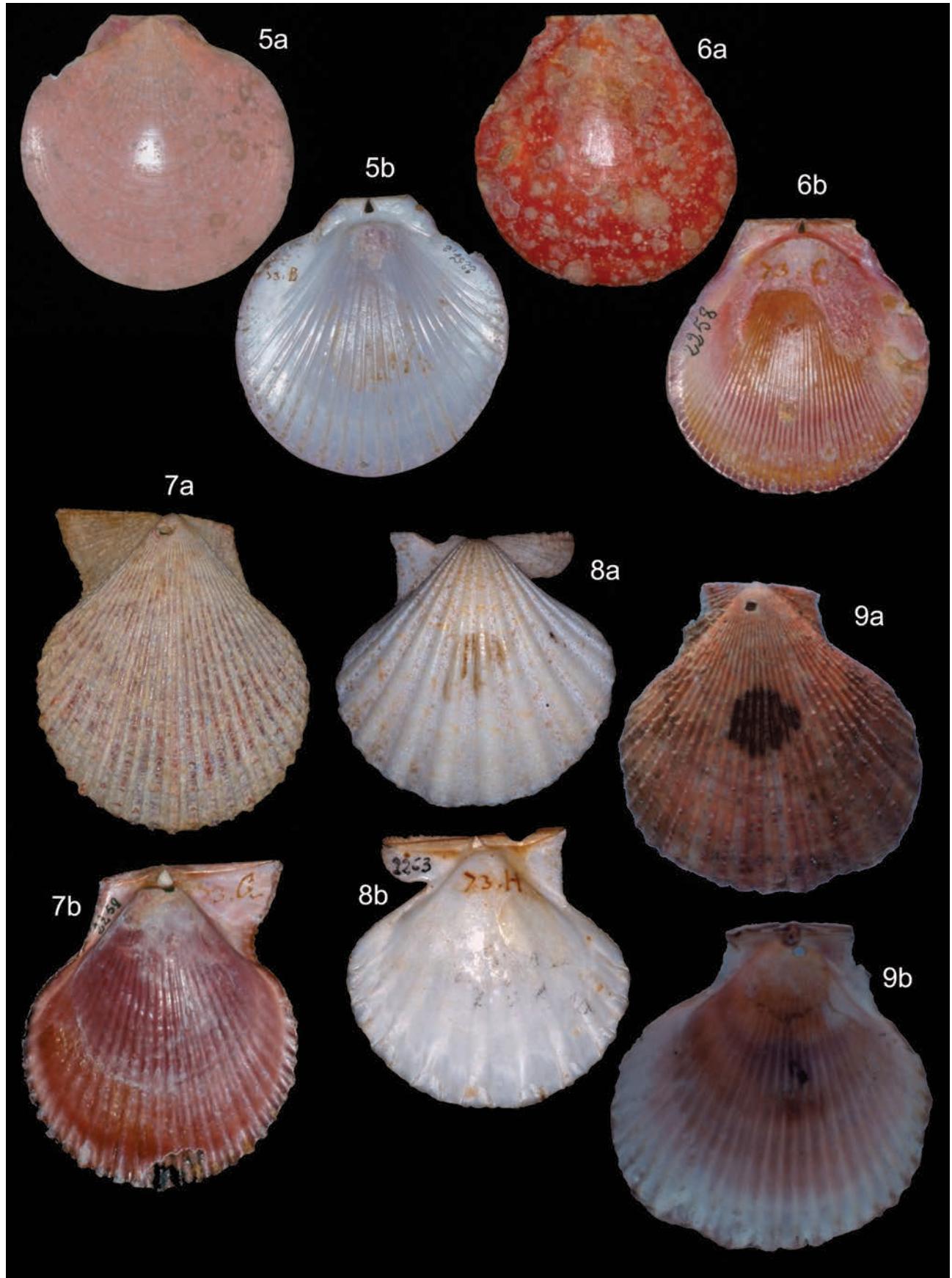
Ostrea radiata Gmelin, 1791: 3320, nr. 28.

Gaultieri's description (pl. 73 fig. Q). — “Pecten Tenuis, striis rotundis striatus, ex albido roseus, tribus radiis albidis per longitudinem radiatus.”

Type material. — Syntype (MSNP G. 2262), left valve (H 39.2 mm, L 38.9 mm). The dimensions fit the specimen figured by Gaultieri (pl. 73 fig. Q).

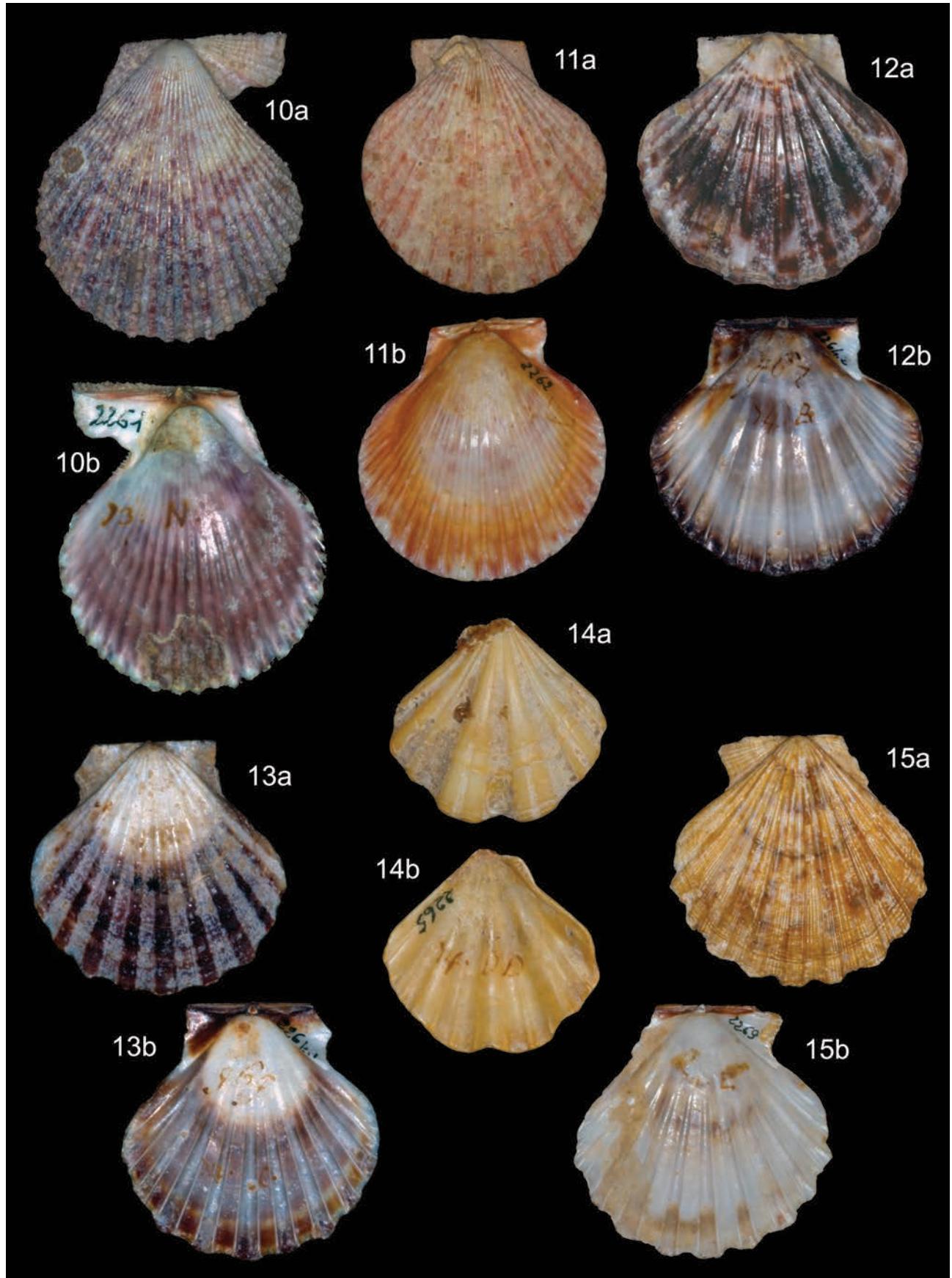
Remarks. — The present figured left valve is similar in all morphological characters to the type material of *Ostrea opercularis* Linnaeus, 1758. *Ostrea radiata* Gmelin is a subjective junior synonym of *O. opercularis*.

For type data, synonyms, additional references, de-



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Figs 5-9. *Ostrea* species. 5a-b, *Ostrea pleuronectes* Linnaeus, 1758, MSNP G. 2257, paralectotype, H 85 mm (a: LV exterior, b: LV interior); 6a-b, *Ostrea oblitterata* Linnaeus, 1758, MSNP G. 2258, paralectotype, H 33.5 mm (a: LV exterior, b: LV interior); 7a-b, *Ostrea varia* Linnaeus, 1758 (referred by Gmelin), MSNP G. 2259, H 49 mm (a: LV exterior, b: LV interior); 8a-b, *Ostrea glabra* Linnaeus, 1758, MSNP G. 2263, paralectotype, H 41 mm (a: RV exterior, b: RV interior); 9a-b, *Ostrea muricata* Gmelin, 1791, MSNP G. 2256, syntype, H 60.8 mm (a: LV exterior, b: LV interior).



Figs 10-15. *Ostrea* species. **10a-b**, *Ostrea varia* Linnaeus, 1758 (referred by Gmelin), MSNP G. 2261, H 37 mm (a: RV exterior, b: RV interior); **11a-b**, *Ostrea radiata* Gmelin, 1791, MSNP G. 2262, syntype, H 39.2 mm (a: LV exterior, b: LV interior); **12a-b**, *Ostrea glabra* Linnaeus, 1758 (referred by Gmelin), MSNP G. 2264.2, H 39.5 mm (a: LV exterior, b: LV interior); **13a-b**, *Ostrea glabra* Linnaeus, 1758 (referred by Gmelin), MSNP G. 2264.1, H 39.1 mm (a: LV exterior, b: LV interior); **14a-b**, *Ostrea depressa* Gmelin, 1791, MSNP G. 2265, syntype, H 24.9 mm (a: RV exterior, b: RV interior); **15a-b**, *Ostrea fasciata* Linnaeus, 1758, MSNP G. 2269, syntype, H 46.4 mm (a: LV exterior, b: LV interior).

scription and distribution of the present species see Dijkstra (1999: 421). The current status of the present species is *Aequipecten opercularis* (Linnaeus, 1758).

Ostrea punctata Gmelin, 1791 (Fig. 17)

Gualtieri, 1742: pl. 74 fig. G [text and figure].

Ostrea punctata Gmelin, 1791: 3320, nr. 29.

Pecten lentiginosus Reeve, 1853: species 76 [text], pl. 20 fig. 76, pl. 35 fig. 170.

Mimachlamys lentiginosa; Dijkstra, 2013: 93, pl. 19 fig. 5a-b, pl. 24 fig. 1a-d.

Gualtieri's description (pl. 74 fig. G). — "Pecten Tenuis, striatus, luteus, maculis albis signatus, prope cardinem candidus, e ex fusco punctatus."

Type material. — Syntype (MSNP G. 2260), right valve (H 49 mm, L 42.9 mm). This unfigured right valve of an articulated specimen fits the dimensions of the left valve figured by Gualtieri (pl. 74 fig. G).

Remarks. — *Ostrea punctata* is the valid name for the Indo-West Pacific species identified uniformly in the literature as *Pecten lentiginosus* Reeve, 1853 (Dijkstra, 2013: 93). The present articulated specimen is similar in all morphological characters to the type material of *Pecten lentiginosus* Reeve, 1853. *Ostrea punctata* is a subjective senior synonym of *P. lentiginosus*. Because Reeve's name is used ubiquitously for this common, well-known species, it is advisable to retain Reeve's name. In this case the current name should be retained through formal reversal of precedence (ICZN, 1999: 28, art. 23.9.1.1, 23.9.1.2).

For type data, additional references, description and distribution of the present species see Dijkstra (2013: 93). The current status of the present species is *Mimachlamys lentiginosa* (Reeve, 1853).

Ostrea aculeata Gmelin, 1791 (Fig. 20)

Gualtieri, 1742: pl. 74 fig. H [text and figure].

Ostrea varia Linnaeus, 1758: 698, nr. 168; Gmelin, 1791: 3324, nr. 48; Dijkstra, 1999: 415, fig. 5A-D.

Ostrea aculeata Gmelin, 1791: 3320, nr. 30.

Gualtieri's description (pl. 74 fig. H). — "Pecten Tenuis, striatus striis imbricatis, & muricatis, ex roseo, ex albido variegatus."

Type material. — Syntype (MSNP G. 2270), right valve (H 50.1 mm, L 47.8 mm). The dimensions of the present right valve fit the specimen figured by Gualtieri (pl. 74 fig. H).

Remarks. — The present figured right valve of *Ostrea aculeata* is similar in all morphological characters to the type material of *Ostrea varia* Linnaeus, 1758. *Ostrea aculeata* is a subjective junior synonym of *O. varia*.

For type data, synonyms, additional references, description and distribution of the present species see Dijkstra (1999: 415). The current status of the present species is *Mimachlamys varia* (Linnaeus, 1758).

Ostrea plana Gmelin, 1791 (Fig. 18)

Gualtieri, 1742: pl. 74 fig. I [text and figure].

Ostrea opercularis Linnaeus, 1758: 698, nr. 171; Gmelin, 1791: 3325, nr. 51; Dijkstra, 1999: 421, fig. 7A-D.

Ostrea plana Gmelin, 1791: 3320, nr. 31.

Gualtieri's description (pl. 74 fig. I). — "Pecten Tenuis, striis rotundis latis, satis complanatus, candidus, carne croceo."

Type material. — Syntype (MSNP G. 2266), right valve (H 37 mm, L 37 mm). The dimensions of the present right valve fit the specimen figured by Gualtieri (pl. 74 fig. I).

Remarks. — The present figured right valve of *Ostrea plana* is similar in all morphological characters to the type material of *Ostrea opercularis* Linnaeus, 1758. *Ostrea plana* is a new subjective junior synonym of *O. opercularis*.

For type data, synonyms, additional references, description and distribution of the present species see Dijkstra (1999: 422). The current status of the present species is *Aequipecten opercularis* (Linnaeus, 1758).

Ostrea media Gmelin, 1791

Gualtieri, 1742: pl. 74 fig. N [text and figure].

Ostrea varia Linnaeus, 1758: 698, nr. 168; Gmelin, 1791: 3324, nr. 48; Dijkstra, 1999: 415, fig. 5A-D.

Ostrea media Gmelin, 1791: 3330, nr. 77.

Gualtieri's description (pl. 74 fig. N). — "Pectunculus, uno striarum ordine alteri superimposito, ex rubro croceus, vel ex piceo nigricans."

Type material. — Syntype (MSNP G. 2271), left valve (H 30 mm, L 26 mm). The dimensions of the present left valve fit the specimen figured by Gualtieri (pl. 74 fig. N).

Remarks. — The present figured left valve of *Ostrea media* is similar in all morphological characters to the type material of *Ostrea varia* Linnaeus, 1758. *Ostrea media* Gmelin is a new subjective junior synonym of *O. varia*.

For type data, synonyms, additional references, description and distribution of the present species see Dijkstra (1999: 415). The current status of the present species is *Mimachlamys varia* (Linnaeus, 1758).

Ostrea florida Gmelin, 1791 (Fig. 21)

Gualtieri, 1742: pl. 74 fig. Q [text and figure].

Ostrea opercularis Linnaeus, 1758: 698, nr. 171; Gmelin, 1791:

3325, nr. 51; Dijkstra, 1999: 421, fig. 7A-D.

Ostrea florida Gmelin, 1791: 3330, nr. 79.

Gualtieri's description (pl. 74 fig. Q). — "Pectunculus, striatus ex albido, & roseo colore depictus."

Type material. — Syntype (MSNP G. 2255), right valve (H 24.2 mm, L 23.9 mm). The dimensions of the present right valve fit the specimen figured by Gualtieri (pl. 74 fig. Q).

Remarks. — The present figured right valve of *Ostrea florida* is similar in all morphological characters to the type material of *O. opercularis* Linnaeus, 1758 (Dijkstra, 1999: 422). *Ostrea florida* Gmelin is a new subjective junior synonym of *O. opercularis*.

For type data, synonyms, additional references, description and distribution of the present species see Dijkstra (1999: 422). The current status of the present species is *Aequipecten opercularis* (Linnaeus, 1758).

Ostrea ochroleuca Gmelin, 1791 (Fig. 23)

Gualtieri, 1742: pl. 74 fig. S [text and figure].

Ostrea varia Linnaeus, 1758: 698, nr. 168; Gmelin, 1791: 3324, nr. 48; Dijkstra, 1999: 415, fig. 5A-D.

Ostrea ochroleuca Gmelin, 1791: 3330, nr. 80.

Gualtieri's description (pl. 74 S). — "Pectunculus, striatus, altero latere leviter granulato, ex flavedine albicans."

Type material. — Syntype (MSNP G. 2254), left valve (H 41.8 mm, L 39 mm). The dimensions of the left valve fit the specimen figured by Gualtieri (pl. 74 fig. S).

Remarks. — The present figured left valve of *Ostrea ochroleuca* is similar in all morphological characters to the type material of *O. varia* Linnaeus, 1758 (Dijkstra, 1999: 415). *Ostrea ochroleuca* Gmelin is a subjective junior synonym of *O. varia*.

For type data, synonyms, additional references, description and distribution of the present species see Dijkstra (1999: 415). The current status of the present species is *Mimachlamys varia* (Linnaeus, 1758).

Ostrea mustelina Gmelin, 1791 (Fig. 24)

Gualtieri, 1742: pl. 74 fig. T [text and figure].

Ostrea varia Linnaeus, 1758: 698, nr. 168; Gmelin, 1791: 3324, nr. 48; Dijkstra, 1999: 415, fig. 5A-D.

Ostrea mustelina Gmelin, 1791: 3330, nr. 81.

Gualtieri's description (TAB. LXXIV. T). — "Pectunculus, striatus, colore mustelino depictus, flavis maculis notatus, & fasciatus."

Type material. — Syntype (MSNP G. 2273), left

valve (H 53.2 mm, L 48.5 mm). The dimensions of the present left valve fit the specimen figured by Gualtieri (pl. 74 fig. T).

Remarks. — The present figured left valve of *Ostrea mustelina* is similar in all morphological characters to the type material of *O. varia* Linnaeus, 1758 (Dijkstra, 1999: 415). *Ostrea mustelina* Gmelin is a subjective junior synonym of *O. varia*.

For type data, synonyms, additional references, description and distribution of the present species see Dijkstra (1999: 415). The current status of the present species is *Mimachlamys varia* (Linnaeus, 1758).

Ostrea flammea Gmelin, 1791 (Fig. 25)

Gualtieri, 1742: pl. 74 fig. V [text and figure].

Ostrea varia Linnaeus, 1758: 698, nr. 168; Gmelin, 1791: 3324, nr. 48; Dijkstra, 1999: 415, fig. 5A-D.

Ostrea flammea Gmelin, 1791: 3330, nr. 82.

Gualtieri's description (TAB. LXXIV. V). — "Pectunculus, minutissime striatus, croceus."

Type material. — Syntype (MSNP G. 2274), right valve (H 21.2 mm, L 17.7 mm). The dimensions of the present right valve fit the specimen figured by Gualtieri (pl. 74 fig. V).

Remarks. — The present figured right valve of *Ostrea flammea* is similar in all morphological characters to the type material of *O. varia* Linnaeus, 1758 (Dijkstra, 1999: 415). *Ostrea flammea* Gmelin is a subjective junior synonym of *O. varia*.

For type data, synonyms, additional references, description and distribution of the present species see Dijkstra (1999: 415). The current status of the present species is *Mimachlamys varia* (Linnaeus, 1758).

Ostrea incarnata Gmelin, 1791 (Fig. 26)

Gualtieri, 1742: pl. 74 fig. X [text and figure].

Ostrea opercularis Linnaeus, 1758: 698, nr. 171; Gmelin, 1791: 3325, nr. 51; Dijkstra, 1999: 421, fig. 7A-D.

Ostrea incarnata Gmelin, 1791: 3330, nr. 83.

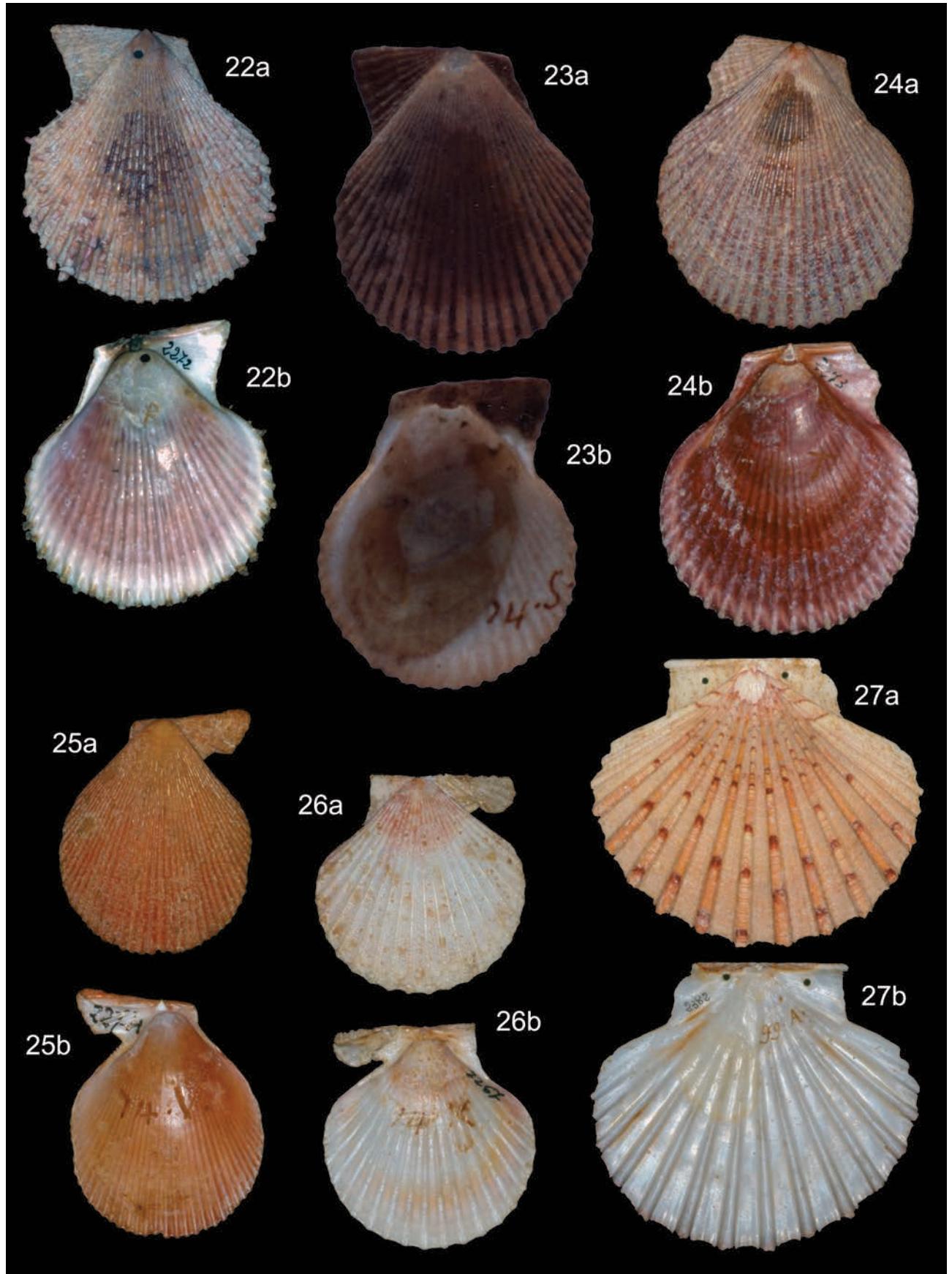
Gualtieri's description (TAB. LXXIV. X). — "Pectunculus, striis late rotundis, colore carneo, & fasciis rubris disinctus."

Type material. — Syntype (MSNP G. 2267), right valve (H 27.2 mm, L 25.8 mm). The dimensions of the present right valve fit the specimen figured by Gualtieri (pl. 74 fig. X).

Remarks. — The present figured right valve of *Ostrea incarnata* is similar in all morphological characters to the type material of *O. opercularis* Linnaeus, 1758 (Dijkstra, 1999: 422). *Ostrea incarnata* Gmelin is a new subjective junior synonym of *O. opercularis*.



Figs 16-21. *Ostrea* species. **16a-b**, *Ostrea pallium* Linnaeus, 1758, MSNP G. 2268, paralectotype, H 49.1 mm (a: LV exterior, b: LV interior); **17a-b**, *Ostrea punctata* Gmelin, 1791, MSNP G. 2260, syntype, H 49 mm (a: RV exterior, b: RV interior); **18a-b**, *Ostrea plana* Gmelin, 1791, MSNP G. 2266, syntype, H 37 mm (a: RV exterior, b: RV interior); **19a-b**, *Ostrea sanguinea* Linnaeus, 1758, MSNP G. 2271, paralectotype (also *Ostrea media* Gmelin, 1791, MSNP G. 2271, syntype), H 30 mm (a: LV exterior, b: LV interior); **20a-b**, *Ostrea aculeata* Gmelin, 1791, MSNP G. 2270, syntype, H 50.1 mm (a: RV exterior, b: RV interior); **21a-b**, *Ostrea florida* Gmelin, 1791, MSNP G. 2255, syntype, H 24.2 mm (a: RV exterior, b: RV interior).



Figs 22-27. *Ostrea* species. **22a-b**, *Ostrea varia* Linnaeus, 1758, MSNP G. 2253, paratype, H 41.8 mm (a: LV exterior, b: LV interior); **23a-b**, *Ostrea ochroleuca* Gmelin, 1791, MSNP G. 2254, syntype, H 27.1 mm (a: LV exterior, b: LV interior); **24a-b**, *Ostrea mustelina* Gmelin, 1791, MSNP G. 2273, syntype, H 53.2 mm (a: LV exterior, b: LV interior); **25a-b**, *Ostrea flammea* Gmelin, 1791, MSNP G. 2274, syntype, H 21.2 mm (a: RV exterior, b: RV interior); **26a-b**, *Ostrea incarnata* Gmelin, 1791, MSNP G. 2267, syntype, H 27.2 mm (a: RV exterior, b: RV interior); **27a-b**, *Ostrea jacobaea* Linnaeus, 1758 (referred by Gmelin as *Ostrea maxima*), MSNP G. 2382, H 87 mm (a: LV exterior, b: LV interior).

For type data, synonyms, additional references, description and distribution of the present species see Dijkstra (1999: 422). The current status of the present species is *Aequipecten opercularis* (Linnaeus, 1758).

Ostrea depressa Gmelin, 1791 (Fig. 14)

Gualtieri, 1742: pl. 74 fig. DD [text and figure].

Ostrea depressa Gmelin, 1791: 3330, nr. 85.

Ostrea flexuosa Poli, 1795: 160, pl. 28 fig. 11.

Flexopecten flexuosus; Raines & Poppe, 2006: 112, pl. 57 figs 1-9, pl. 58 figs 1-9, pl. 59 figs 1-9.

Gualtieri's description (pl. 74 fig. DD). — "Pectunculus complanatus, ipsis latissimis striis bifidis, ex albido flavus."

Type material. — Syntype (MSNP G. 2265), right valve (H 24.9 mm, L 26.4 mm). The dimensions of the present right valve fit the specimen figured by Gualtieri (pl. 74 fig. DD).

Remarks. — The present figured right valve of *Ostrea depressa* is similar in all characters to the description and figure of *O. flexuosa* Poli, 1795. *Ostrea depressa* Gmelin is a new subjective senior synonym of *O. flexuosa*. Poli's species name is used ubiquitously in the literature for this well-known pectinid from the Mediterranean Sea. In this case the current name should be retained through formal reversal of precedence (ICZN, 1999: 28, art. 23.9.1.1, 23.9.1.2).

For type data, synonyms, additional references, description and distribution of the present species see also Dijkstra & Goud (2002: 60). The current status of the present species is *Flexopecten flexuosus* (Poli, 1795).

DISCUSSION

We were not lucky enough to find any tangible evidence of Rumphius' documents in the library of the University of Pisa or of his shells in the collection of the MSNP, which was in complete disorder due to the reconstruction of the monastery at that time. However, I traced old Pectinidae specimens known from the tropical southwestern Pacific (*Ostrea pallium* Linnaeus, 1759, now *Gloripallium pallium*; *Ostrea pleuronectes* Linnaeus, 1758, now *Amusium pleuronectes*; *Ostrea oblitterata* Linnaeus, 1758, now *Dentamussium oblitteratum*; *Ostrea radula* Linnaeus, 1758, now *Decatoplecten radula*; and *Ostrea punctata* Gmelin, 1791, now *Mimachlamys punctata*), which possibly originated from the Moluccas (Indonesia), sent by Rumphius through the United East Indian Company (V.O.C.) to Cosimo III, grand duke of Tuscany. Duplicates of these naturalia were donated to Gualtieri for his private collection, now in the MSNP. These pectinid species were also recorded by Rumphius (1705), and

Fig. Gualtieri	Linnaeus (1758)	Gmelin (1791)	Types	MSNP
T. 73. B	<i>O. pleuronectes</i>	<i>O. pleuronectes</i> L.	Paralectotype	G. 2257
T. 73. C	<i>O. oblitterata</i>		Paralectotype	G. 2258
T. 73. C		<i>O. tenuis</i>	Syntype	G. 2258
T. 73. D		<i>O. lutea</i>	not traced	
T. 73. E		<i>O. plica</i> Linnaeus ?	not traced	
T. 73. F		<i>O. gibba</i> Linnaeus	not traced	
T. 73. G		<i>O. varia</i> Linnaeus	traced	G. 2259
T. 73. H	<i>O. glabra</i>	<i>O. glabra</i> Linnaeus	Paralectotype	G. 2263
T. 73. I		<i>O. muricata</i>	Syntype	G. 2256
T. 73. L		<i>O. tranquebaria</i>	not traced	
T. 73. M		<i>O. tranquabarria</i>	not traced	
T. 73. N		<i>O. varia</i> Linnaeus	traced	G. 2261
T. 73. O		<i>O. conspersa</i>	not traced	
T. 73. P		<i>O. nodulosa</i>	not traced	
T. 73. Q		<i>O. radiata</i>	Syntype	G. 2262
T. 73. R		<i>O. islandica</i> (Müller)	not traced	
T. 74. A		<i>O. glabra</i> Linnaeus	not traced	
T. 74. B		<i>O. glabra</i> Linnaeus	traced	G. 2264.2
T. 74. C		<i>O. glabra</i> Linnaeus	traced	G. 2264.1
T. 74. D		<i>O. glabra</i> Linnaeus	not traced	
T. 74. E	<i>O. fasciata</i>		Syntype	G. 2269
T. 74. F	<i>O. pallium</i>	<i>O. pallium</i> Linnaeus	Paralectotype	G. 2268
T. 74. G		<i>O. punctata</i>	Syntype	G. 2260
T. 74. H		<i>O. aculeata</i>	Syntype	G. 2270
T. 74. I		<i>O. plana</i>	Syntype	G. 2266
T. 74. L		<i>O. radula</i> Linnaeus	not traced	
T. 74. M		<i>O. sanguinea</i> L. ?	not traced	
T. 74. N	<i>O. sanguinea</i>		Paralectotype	G. 2271
T. 74. N		<i>O. media</i>	Syntype	G. 2271
T. 74. O		<i>O. media</i>	not traced	
T. 74. P		<i>O. crocea</i>	not traced	
T. 74. Q		<i>O. florida</i>	Syntype	G. 2255
T. 74. R	<i>O. varia</i>	<i>O. varia</i> Linnaeus	Paralectotype	G. 2272
T. 74. S		<i>O. ochroleuca</i>	Syntype	G. 2254
T. 74. T		<i>O. mustelina</i>	Syntype	G. 2273
T. 74. V		<i>O. flammea</i>	Syntype	G. 2274
T. 74. X		<i>O. incarnata</i>	Syntype	G. 2267
T. 74. Z		<i>O. glabra</i> Linnaeus	not traced	
T. 74. AA		<i>O. pusilla</i>	not traced	
T. 74. BB		<i>O. guttata</i>	not traced	
T. 74. CC	<i>O. peslutrae</i>	<i>O. plica</i> Linnaeus	not traced	
T. 74. CC		<i>O. peslutrae</i> L.		
T. 74. DD		<i>O. depressa</i>	Syntype	G. 2265
T. 98. A	<i>O. maxima</i>		not traced	
T. 98. B	<i>O. maxima</i>		not traced	
T. 99. A		<i>O. maxima</i> L.	traced	G. 2382
T. 99. B	<i>O. jacobaea</i>	<i>O. jacobaea</i> L.	Paralectotype	G. 2384
T. 99. C	<i>O. nodosa</i>	<i>O. nodosa</i> L.	Paralectotype	G. 2385
T. 99. D	<i>O. nodosa</i>	<i>O. nodosa</i> L.	traced	G. 2386

Table 1. References of Pectinidae in Linnaeus (1758) and Gmelin (1791) to the figures of Gualtieri (1742).

were recently rediscovered in Ambon (Dijkstra, 1997). In Gualtieri's "Index Testarum Conchyliorum [...]" there are 46 figures of Pectinidae (1742: pls 73, 15 figs; pl. 74, 25 figs; pl. 98, 2 figs; pl. 99, 4 figs). Twenty-five

figured specimens were traced, and twenty-one were not found.

Ten of these figured pectinid specimens were referred to by Linnaeus (1758). Eight species were traced in the collection of Gualtieri, but two species were not found (see Table 1). Paralectotypes of seven Linnean species (*Ostrea pleuronectes*, *O. obliterata*, *O. glabra*, *O. pallium*, *O. sanguinea*, *O. jacobaea*) and one syntype (*Ostrea fasciata*, not traced in the collection of the Zoological Museum of the Uppsala University or in the Linnean Society of London in Burlington House (Dijkstra, 1999)) are herein identified. *O. fasciata* is unmistakably conspecific with *O. glabra* and is a new synonym recognised herein.

Gmelin (1791) also referred to 33 species of Pectinidae illustrated in Gualtieri's work (12 species already described by Linnaeus, one species named by Müller (1776), and the other 20 pectinid species proposed by Gmelin himself). Thirteen species described as new by Gmelin are still present in the collection, but seven were not found. It is most likely that Gmelin only described these new taxa on the basis of Gualtieri's figures. Hence, most of his newly described species are junior synonyms of Linnaeus' species *Ostrea opercularis* or *Ostrea varia* (see Table). Thirteen syntypes (*Ostrea tenuis*, *O. muricata*, *O. radiata*, *O. punctata*, *O. aculeata*, *O. plana*, *O. media*, *O. florida*, *O. ochroleuca*, *O. mustelina*, *O. flammea*, *O. incarnata*, *O. depressa*) are herein recognised. Eleven are junior synonyms (*O. tenuis* = *O. obliterata* Linnaeus, *O. muricata* = *O. varia* Linnaeus, *O. radiata* = *O. opercularis* Linnaeus, *O. aculeata* = *O. varia* Linnaeus, *O. plana* = *O. opercularis* Linnaeus, *O. media* = *O. varia* Linnaeus, *O. florida* = *O. opercularis* Linnaeus, *O. ochroleuca* = *O. varia* Linnaeus, *O. mustelina* = *O. varia* Linnaeus, *O. flammea* = *O. varia* Linnaeus, *O. incarnata* = *O. opercularis* Linnaeus), and two are senior synonyms (*O. punctata* = *Pecten lentiginosus* Reeve, 1853 and *O. depressa* = *Ostrea flexuosa* Poli, 1795).

Both senior synonyms are suppressed following the ICZN (1999: art. 23.9.1.1). Five of Gmelin's species are newly recognised synonyms (*O. tenuis*, *O. plana*, *O. media*, *O. florida*, *O. incarnata*, *O. depressa*).

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Figs 28-29. *Ostrea* species. 28a-b, *Ostrea jacobaea* Linnaeus, 1758, MSNP G. 2384, paralectotype, H 76 mm (a: RV exterior, b: RV interior); 29a-b, *Ostrea nodosa* Linnaeus, 1758, MSNP G. 2385, paralectotype, H 103 mm (a: RV exterior, b: RV interior).

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