

## PECTENS FROM THE KOSHIBA NEOGENE.

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With 1 plate.

Up to this time, seven species of *Pecten* have been distinguished in the Neogene of Koshiba. They are the following:—

1. *Pecten vesiculosus* Dkr.
2. „ *irregularis* Sow.
3. „ *Yessoensis* Jay.
4. „ *similis* Lasky.
5. „ *tigerrinus* Müll.
6. „ *Tokunagai* n. sp.
7. „ *cosibensis* n. sp.

Of these, *Pecten vesiculosus* and *P. irregularis* are still living in Central Japan, while *P. yessoensis* has retreated to the north of Aomori, to the Hokkaido and Sakhalin. *Pecten similis* is known in Japan only from the Strait of Corea which it is found both living and fossil in various parts of Europe. *Pecten tigerrinus* is also recent and fossil in Europe but living only in its northern half. *Pecten Tokunagai* and *P. cosibensis* are entirely new forms.

### DESCRIPTION OF THE SPECIES.

#### 1. *Pecten vesiculosus* Dkr.

Pl. I. Figs. 8, 9, 10.

Dunker. Index. Moll. Maris Japan., p. 241, pl. XI, fig. 1.

There are four specimens of the right valve, and three of the left.

The shell is slightly inequivalve and inequilateral, with about sixteen, nearly equal, rounded, smooth or striated ribs which are accompanied on both sides and close to their base by a small riblet. The interspaces between the ribs are furnished with fine longitudinal lines crossed by fine transverse ridges which continue also to the flanks of the ribs. Ears unequal, ribbed; ribs scabrous. Byssal notch distinct.

The largest specimen in our collection measures about 25 millim. in height and breadth, and about 4.5 in depth.

Dunker mentions it as living in Japan without giving any exact locality. But among the drift-shells collected on the coast of Kii, I found several specimens belonging to this species.

## 2. *Pecten irregularis* Sow.

Pl. I. Figs. 5—7.

Sowerby. *Thes. Conch.*, vol. I, p. 69, pl. XIII, figs. 51, 52. Dunker. *Index Molluscorum*, p. 240, pl. XI, figs. 2, 15. Lischke. *Japan. Meeres-conchylien*, vol. I, p. 170.

The shell is small, ovate, inequivalve, flatly convex, and radiately ribbed. The ribs are small, numerous, unequal, subangulated and scaly. The ears are very unequal, the posterior being the smallest; they are also ribbed, with ribs scaly. Byssal notch distinct.

We possess five specimens, in two of which the beak is broken. The right valve represented in fig. 6 measures 21 millim. in height and 19 in breadth, while the left valve shown in fig. 5 measures 17 millim. in height and 14 in breadth.

The species is living in Central Japan, from Awa Peninsula down to Kyushu.

## 3. *Pecten yessoensis* Jay.

Pl. I. Fig. 13, 14.

Jay. *Japan Expedition Shells*, p. 293, pl. III, fig. 34, pl. IV, fig. 1, 2. Lischke. *Jap. Meeresconch.*, vol. I, p. 165, pl. X, fig. 3, 4, II, pl. XIII. Dunker. *Index Moll.*, p. 240. Schrenck. *Moll. Amurl.*, p. 484, pl. XX, figs. 1—4.

There are only a few worn and broken specimens which belong mostly to young shells. The ribs in the adult forms number about twenty-two, while in ours they are only seventeen to twenty.

The species is still living in Japan from Tokyo northward up to Sakhalin.

#### 4. *Pecten similis* Lasky.

Pl. I. Fig. 1.

Lasky. Mem. Wern. Soc., tome I, p. 387, pl. VIII, fig. 8. Wood. Cray Moll., part II, Bivalves, p. 25, pl. V, fig. 4a-c. Nyst. Conch. Terr. Tert. Belgique, Ier part, p. 154, pl. XV, fig. 6 ab.

A small left valve 11 millim. in height and breadth. That it belongs to *Pecten similis* is shown by its smooth surface, subequal ears and rounded shoulders. We discern fine concentric lines by a lens.

Fossil in the Red Crag of England, in the Scaldisien of Belgium and in the Pliocene of Southern Italy.

Living also in Europe (Mediterranean Sea, North Sea, Norway etc) and in Japan (Strait of Corea).

#### 5. *Pecten tigerrinus* Müll.

Pl. I. Figs. 11, 12.

*Pecten tigerrinus* Müller. Zool. Han. Prod. I, p. 248, No. 2993. Nyst. Cog. Foss. Belge, p. 303, pl. figs. 4-10. Conch. Terr. Terf. Belgique, part I, p. 152, pl. XV, figs. 4a-3.

*Pecten tigrinus*. Wood, Monog. Cray Moll., part II, Bivalves, p. 27, pl. V, fig. 2a-9.

There are two specimens of a *Pecten*,—a right and a left valve— which is to be identified with the above named species.

The left valve (fig. 12) is 32 millim. high and 30 millim. broad, while the right (fig. 13) is 20 by 18. They are both provided with very unequal, rounded, radiating ribs of which about five are especially large. Of these five, the one found in the middle of the

shell is the largest. The right valve (fig. 11.) is also furnished with a deep concentric groove at a place corresponding to about one-fourth of the height from the ventral margin, constricting all the ribs over which it passes. The ears which are unequal are well preserved in the specimen represented in fig. 12.

*Pecten tigerrinus* is a very variable species, sometimes being quite smooth, sometimes being coarsely ribbed. Our specimens seem to correspond to the variety gamma (figs. e and f) of Wood, though not so orbicular in shape.

It is fossil in the English Crag from the Coralline Crag to the Chilles ford beds, in the Scaldisien of Belgium and also in the Pliocene of Southern Italy.

It is also living on the coast of Brittany, in the North Sea and near Iceland, but not in Japan.

## 6. *Pecten Tokunagai* n. sp.

Pl. I. Fig. 2.

A left valve partly broken and about 68 millim. high. It is orbicular, thin, moderately swollen (12 millim. deep) and furnished with about thirty-three simple, flatly rounded, subequal, straight radiating ribs which dis-appear near the beak. The interspaces are much wider than the ribs themselves and are occasionally furnished with a secondary riblet which does not reach as high as the main ribs. The ears are nearly equal.

## 7. *Pecten cosibensis* n. sp.

Pl. I. Figs. 3, 4.

There are two specimens which I consider as belonging to this species. The one is a right valve (fig. 3) about 56 millim. high and 12 millim. deep, suborbicular in shape and tolerably convex with

unequal, rounded, straight, radiating ribs more or less in bundles separated by deep valleys which are also provided with radiating riblets. The surface is marked with a few unequally deep concentric furrows situated at unequal distances from one another. The ears are unequal with strong interrupted ribs. Byssul notch distinct.

The other valve which lacks the umbonal portion is much flatter and with only a single deep concentric groove. It may be a left valve.

This species show some relationship to *Pecten Ruschenbergeri* Tryon (Chemnitz Conchylien-Cabinet Vol. VII, p. 275. pl. 72 fig. 4) from Bay of Mascat.



### EXPLANATION OF PLATE I.

Fig. 1. *Pecten similis* Lasky. Left valve.

Fig. 2. *Pecten Tokunagai* Yok. Left valve.

Fig. 3, 4. *Pecten cosibensis* Yok. 3. Right valve. 4. Left valve.

Fig. 5, 6, 7. *Pecten irregularis* Sow. 5. Left valve. 6, 7. Right valves.

Figs. 8, 9, 10. *Pecten vesiculosus* Dkr. 8. Right valve. 9, 10. Left valves.

Figs. 11, 12. *Pecten tigerrinus* Müll. 11. Right valve. 12. Left valve.

Figs. 13, 14. *Pecten yessoensis* Jay. 13. Right valve. 14. Left valve.