

**Note on an ammonite species of *Pachydiscus*
from Awaji Island, Southwest Japan***

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Abstract

A pachydiscid ammonite from the Upper Cretaceous Izumi Group of Awaji Island is described in this paper. It is identified with *Pachydiscus preegertoni* COLLIGNON. This species is closely allied to *P. kobayashii* (SHIMIZU) from the Izumi Group of the Izumi Mountains, but is distinguished by its smaller size and its more inflated whorl. Although the described specimen was obtained from a new locality in a barren part between the Zone of *Pachydiscus awajiensis* (Upper Campanian) below and the Zone of *Nostoceras hetonaiense* (Lower Maastrichtian) above, the horizon of it is presumed within the higher part of the Upper Campanian.

In connection with this identification, a result of the restudy by one of us (T. M.) on several ammonites of the so-called *Pachydiscus egertoni* is briefly noted as an appendix.

Introduction

In the course of a geological excursion in 1984, one of us (T. O.) found an ammonite from the Upper Cretaceous Izumi Group of Awaji Island, Southwest Japan. After a preliminary study, the specimen was sent to T. M., who invited Y. M. to this cooperative study, because Y. M. was engaged in the study of the Late Cretaceous ammonites from the Izumi Group.

This paper gives a result of our study on this ammonite, which may supplement the recently issued monograph (MOROZUMI, 1985).

Note on stratigraphy

A revised stratigraphy of the Upper Cretaceous Izumi Group in Awaji Island has been recently described by one of us (MOROZUMI, 1985, p. 4–6, with a geological map in fig. 1), and is not repeated here. The locality of the ammonite found by OZAWA is

*Contributions from the Osaka Museum of Natural History, No. 284 (Received Nov. 1, 1985)

indicated in Fig. 1. It is linearly about 4 km west of Fukura and 2.3 km south of Anaga. It is new and should be added to the localities (Aw 1 to Aw 17) in the map of MOROZUMI (*op. cit.*). Stratigraphically it is about 100 m above the base and in the lower part of the Kita-ama Formation.

There is a fault of meridional trend, called the Minato-Honjo Fault, by which the strata may be dislocated to some extent. This locality is in the western block bounded by the fault. In the Anaga Formation which underlies the Kita-ama in this western block, there is another ammonite locality (Aw 8), where *Pachydiscus* cf. *P. awajiensis* MOROZUMI and *P. aff. P. awajiensis* were obtained (see MOROZUMI, 1985, p1. 4, figs. 1 and 3).

In the summarized biostratigraphic sequence of the Izumi Group in Awaji, MOROZUMI (1985) set up the Zone of *Pachydiscus awajiensis* in a comparatively higher part of the Upper Campanian. The type locality is Aw 7 in the eastern block, where *Baculites inornatus* MEEK is associated. The latter species has been reported also from locs. Aw 10 and Aw 11, which are higher than Aw 7 (OBATA and MATSUMOTO, 1963; MOROZUMI, 1985). Again in the eastern block, at locs. Aw 12, Aw 13 and Aw 14 close to the eastern coast of the island, *Nostoceras hetonaiense* MATSUMOTO occurs commonly. Therefore, the Zone of *Nostoceras hetonaiense* has been established by MOROZUMI (1985). At locs. Aw 13 and Aw 14 *Inoceramus (Endocostea) shikotanensis* NAGAO et MATSUMOTO is associated with *N. hetonaiense*. This assemblage leads us to allocate the Zone of *N. hetonaiense* in the lower part of the Maastrichtian as in the case of the correlative zone in Hokkaido.

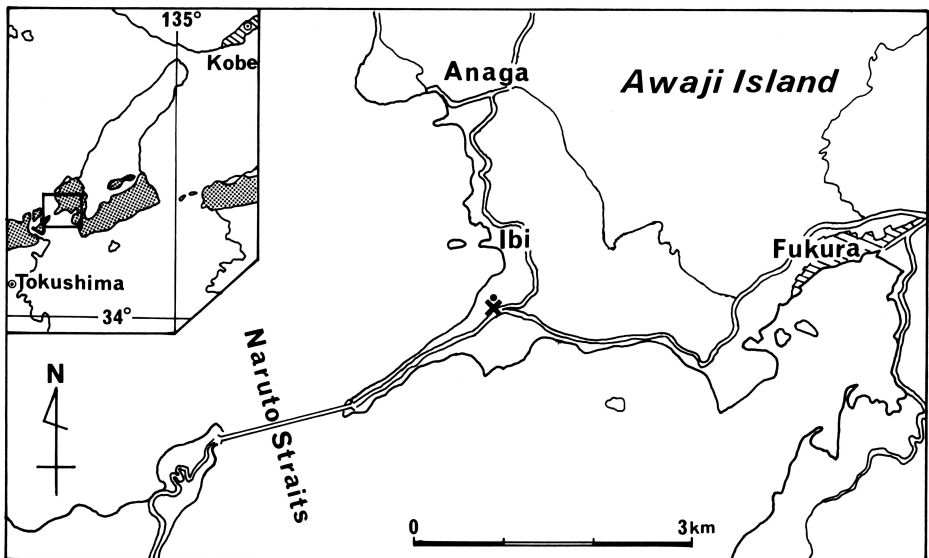


Fig. 1. Map showing the locality of the described ammonite with a cross mark. Inset at the upper left corner is an index map, in which the dotted area indicates the distribution of the Izumi Group.

To sum up, the new ammonite locality of OZAWA is biostratigraphically in the previously barren part between the Zone of *Pachydiscus awajiensis* below and the Zone of *Nostoceras hetonaiense* above.

Incidentally, there is the Straits of Naruto which separates Awaji from Shikoku. Some faults might run in the straits, but there is little displacement of strata as evidenced by the occurrences of *Praviloceras sigmoidale* on both sides of the straits (see MATSUMOTO *et al.*, 1981, text-fig. 2). At several localities in Shikoku on the western side of the straits, on the straight extension of the beds at and near the new locality of ammonite in Awaji, SUYARI and HASHIMOTO (1985) collected samples of siliceous nodules and calcareous patches, from which they have identified certain radiolarian species and concluded a Campanian age of the strata.

As is described below, the ammonite is identified with *Pachydiscus preegertoni* COLLIGNON, which indicates also a Campanian age (see “Concluding remarks”).

Palaeontological description

Family Pachydiscidae SPATH, 1922

Genus *Pachydiscus* ZITTEL, 1884

Type species : *Ammonites neubergicus* HAUER, 1858.

Remarks : See MATSUMOTO *in* MATSUMOTO *et al.* (1979, p. 50) and MATSUMOTO and MIYAUCHI (1984, p. 40–41) for the general account of this genus.

Pachydiscus preegertoni COLLIGNON, 1955

Pl. 1, fig. 1

1864. *Ammonites egeronianus* (sic.) FORBES: STOLICZKA, *Mem. Geol. Surv. India, Palaeont. Indica* (3): 104, pl. 53, figs. 1, 1a (only).
1955. *Pachydiscus praegertoni* COLLIGNON, *Ann. Géol. Serv. Mines, Madagascar* 21: 61, pl. 20, figs. 1, 1 a, 1b; text-fig.18.
1970. *Pachydiscus praegertoni* COLLIGNON : COLLIGNON, *Atlas des fossiles caractéristiques de Madagascar (Ammonites)*, 16: 38, pl. 623, fig. 2312.

Material: GK. H8086, collected by T. OZAWA from a bed of sandstone exposed on road side, about 4 km west of Fukura (see Text-fig. 1), which is slightly distorted secondarily and fairly well preserved on the right side with altered test partly attached, but badly eroded on the left side.

Description: Shell nearly wholly septate, but for the preserved last portion where the posterior fraction of body-chamber remains. The last suture at diameter = 136 mm.

Shell fairly involute, with fairly narrow umbilicus which is encircled by steep wall. Whorl somewhat higher than broad, subelliptical–suboval in section, broadest in the inner (“lower”) part, with subrounded umbilical shoulder and gently (earlier) to

moderately (later) convex flanks which converge to gently arched venter. (The top of venter flattened at the preserved last part owing partly to erosion on the siphonal zone.)

Ribs fairly coarse and distant on the last half of the septate whorl, moderately thick and strong on the inner half of the flank but gradually lowered and broadened outward, subradial to gently concave on the flank and slightly projected on crossing the venter. Shorter secondary ribs normally intercalated between longer primaries on the earlier quarter, becoming occasional and faint or none on the last quarter, suggesting the loss of secondaries on the unpreserved body-chamber. The umbilical bullae absorbed by the strengthened primary ribs on the inner part of the flank.

Ribs on the preceding half whorl narrower and more numerous, with intercalated one or two shorter ones at each interval of longer ones. The primaries somewhat strengthened on the inner part of the flank, forming umbilical bullae. Still inner whorls not exposed.

Sutures, which are exposed here and there with some erosion, show generally the *Pachydiscus* pattern.

Table 1. Measurements (in mm) of *P. preegertoni* and *P. kobayashii*.

	Diameter (D)	Umbilicus (U)	Whorl height (H)	Whorl breadth costal (B)	intercostal (B')	B/H	B'/H
(1)	136.0	31.0 (.23)	63.0 (.46)	55.5 (.41)	53.0 (.39)	.88	.84
(2)	186.0	47.0 (.25)	83.0 (.45)	73.0 (.39)	—	.88	—
(3)	202.0	48.0 (.24)	97.0 (.48)	69.0 (.34)	—	.71	—

(1) present specimen, (2) holotype of *P. preegertoni* (after COLLIGNON, 1955), (3) holotype of *P. kobayashii* (after MATSUMOTO and MOROZUMI, 1980).

Comparison: The above-described characters of the present specimen conform well the specific characters of *Pachydiscus preegertoni* COLLIGNON, 1955, which was established on several specimens from the Middle Campanian of Menabe, Madagascar.

The holotype of *P. preegertoni* has its last suture at D=125 mm and its body-chamber is preserved for about 200°. Our example is somewhat larger than the holotype, because its phragmocone ends at D=136 mm and its entire diameter would be about 200 mm at the end of its lost body-chamber. Thick and distant major ribs, which become blunt outward, characterize the body-chamber of the holotype, numbering 9 in a half whorl, with a few shorter ribs. More numerous, narrower ribs with more frequently intercalated secondaries are on its phragmocone.

In our specimen the thick and distant ribs begin to appear already at D=ca 100 mm and number also 9 in the last half of the septate whorl. As in the holotype, they tend to become thicker and more distant adorally and weaker and broader outward. The same tendency may have continued on the main part of the lost body-chamber. Anyhow, the two specimens conform in essential characters, but for a minor difference in size or in the growth-stage where adult characters begin to appear. In fact, COLLIGNON (1955)

recorded the presence of a larger specimen (with $D=212$ mm), although its characters were not described in detail.

Pachydiscus kobayashii (SHIMIZU, 1935) (see MATSUMOTO and MOROZUMI, 1980), from the A2-horizon of the Izumi Group in the Izumi Mountains, is closely allied to *P. preegertoni*, but is distinguished by its more compressed whorl (B/H being 0.71–0.75 as compared with 0.85–0.90 of the latter at corresponding growth-stages) and its larger size on the average. The holotype of *P. kobayashii* is wholly septate but 200 mm in diameter. Some other examples of *P. kobayashii* attain 300 mm in diameter. Although there may be some variation of size in both species, the available specimens show the specific difference in size.

The holotype of *P. kobayashii*, UMUT. MM7720, from Izumi, has weaker ribs than those of the Awaji specimen of *P. preegertoni*, but another example of *P. kobayashii* illustrated by MATSUMOTO and MOROZUMI (1980, pl. 3, fig. 1) has fairly distant, thick and strong ribs in the late stage. Its whorl is, however, distinctly more compressed than that of *P. preegertoni*.

A specimen illustrated later by COLLIGNON (1970) under *P. preegertoni* has a comparatively more compressed whorl (B/H=0.82), narrower umbilicus (U/D=0.21) and seemingly weaker ribs than a normal form, and thus approaches to *P. kobayashii* in morphological characters. COLLIGNON noted that it was found rarely in a higher part of the Middle Campanian, i. e. in his Zone of *Delawarella subdelawarensis*–*Australiella australis* and that the normal form occurred commonly at or near the top of his Subzone of *Eupachydiscus lamberti*, i. e. the lower to middle part of Middle Campanian. We would agree with COLLIGNON in referring that specimen to *P. preegertoni* as an extreme variety.

Lastly, the described specimen from Awaji is very similar to one of the illustrated specimens of *Ammonites egertonianus* by STOLICZKA (1864, pl. 53, fig. 1, 1a) from the Ariyalur Group. Although the secondary ribs disappear earlier than in our example, that specimen should be transferred from *P. egertoni* to *P. preegertoni* (see also Appendix).

Occurrence: Rarely found from the road side cutting about 800 m south of Ibi, Seidan-cho, Mihara-gun, Hyogo Prefecture* (Lat. $34^{\circ}14.9'$ N; Long. $134^{\circ}40.7'$ E), in a bed of conglomeratic muddy sandstone, stratigraphically about 100 m above the base of the Kita-ama Formation, Izumi Group.

(*The southern part of Awaji Island belongs administratively to Mihara-gun, Hyogo Prefecture.)

Concluding remarks

An ammonite obtained from a new locality 4 km west of Fukura and 2.3 km south of Anaga is identified with *Pachydiscus preegertoni* COLLIGNON. Biostratigraphically this locality was in a barren part between the Zone of *Pachydiscus awajiensis* (Upper Campanian) below and the Zone of *Nostoceras hetonaiense* (Lower Maastrichtian)

above. In Madagascar *P. preegertoni* occurs in the middle part of the Campanian. Now the distribution of this species is extended to southern India and further to Japan. It may have a longer range up to the higher part of the Upper Campanian.

The true stratigraphic relation between the bed with *P. preegertoni* in Awaji Island and the bed with *P. kobayashii* in the Izumi Mountains should be worked out carefully, although the former can be presumed to be lower than the latter.

Appendix

Remarks on the so-called *Pachydiscus egertoni* (FORBES)

Tatsuro MATSUMOTO

Just 50 years ago I studied preliminarily three ammonites labelled as *Parapachydiscus egertoni* or *P. aff. egertoni* in the geological collections of the University of Tokyo. The tentative conclusion in my paper (MATSUMOTO, 1936) was that they were not identified with *P. egertoni* (FORBES). One of them, *P. aff. P. egertoni* of KOBAYASHI (1931, p. 635, pl. 11), now registered UMUT. MM7720, was named by SHIMIZU (1935, p. 208) as *Parapachydiscus kobayashii* with the reason that "it differs from *P. egertoni* (FORBES) in having a somewhat different ornamentation", but how different was not described by KOBAYASHI (1931) nor by SHIMIZU (1935). My paper was written independently and was issued in the next year (1936). In my paper the distinctions from typical species of the group of *P. gollevillensis* (d'ORBIGNY), including *P. egertoni*, in shell-form and ornamentation were described at length, but I hesitated to propose a new specific name for *P. aff. egertoni* of KOBAYASHI. I did not cite SHIMIZU's paper, because it was not issued when I wrote the manuscript. Strictly speaking, SHIMIZU's proposal of the specific name may have been insufficient for the requirements of the International Code of Zoological Nomenclature, but subsequent authors in Japan frequently used the specific name *Pachydiscus kobayashii* (SHIMIZU, 1935).

Aside from the above nomenclatorial doubt, *Pachydiscus kobayashii* is a distinct species as defined and remarked by MATSUMOTO and MOROZUMI (1980). We thought that the "different ornamentation" was evidently shown by the fine illustration of KOBAYASHI (1931).

I still hesitate to give definite specific names to the two other specimens. One of them, *P. egertoni* of KAWADA (1929, listed) (MATSUMOTO, 1936, pl. 30, figs. 2, 3), from the Ryugase Group of South Sakhalin, may represent a middle growth-stage of a large shell of *Canadoceras*, because it has numerous ribs of which some are periodically strong and accompanied with constrictions. The other, *P. egertoni* of YABE (1909, listed) (MATSUMOTO, 1936, pl. 31, figs. 2, 3), from Kikumewawa of Mikasa (Ikushumbetsu) district, may be a certain compressed form of *Eupachydiscus* sp., e. g. *E.*

haradai usheri MATSUMOTO (1959, p. 34), because it closely resembles the specimen of USHER (1952, pl. 13, figs. 1–3), a paratype of the subspecies. Anyhow, I should examine more specimens from Kikume-zawa and other places to lead a definite conclusion.

In addition to the type specimen of *Pachydiscus egertoni*, there are several specimens from southern India, which were referred to the same species but are doubtful. My observations on them are noted below.

(1) *Ammonites egertoni* FORBES, 1846.

The lectotype designated by myself (MATSUMOTO, 1959, p. 42) is BM. 10479, now corrected as BM.C.51038 (see PHILLIPS, 1977), (FORBES, 1846, pl. 9, fig. 1) (Fig. 2 in this paper) from the Valudayur Group of the Pondicherry district, southern India. It is a wholly septate fine specimen of about 105 mm in diameter, but the adult type ornament occurs in its preserved last half whorl, which is characterized by very distant major ribs, 6 in number, each arising from the umbilical bulla, extending radially with slightly concave curvature, and broadened and lowered outward, fading away on the venter. The whorl is somewhat higher than broad ($B/H=0.85$) (see also Table 2), broadest near the umbilical shoulder and subovoid in cross-section, with somewhat convex and convergent flanks. The umbilical shoulder is subrounded, passing abruptly to the nearly vertical wall.

On the preceding part of the whorl, the ornament is differentiated into distant

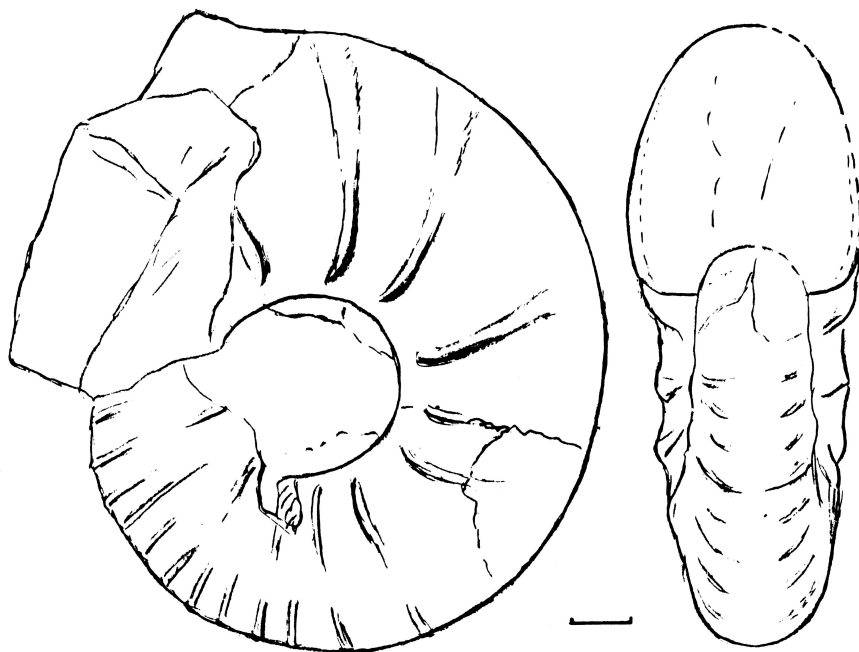


Fig. 2. Lectotype of *Pachydiscus egertoni* (FORBES).

Drawing in lateral and frontal views. Scale bar=10 mm. (T. M. delin.)

bullate ribs around the umbilicus and more numerous finer ribs on the outer part, with much weakening of the primary ribs at about the middle of flank, as FORBES (1846, p. 109) correctly described. The ribs are nearly rectiradiate, crossing the venter almost vertically with little projection and with weakening on the siphonal zone. They show a gently concave curvature as they approach the adult type ribs mentioned above. About 10 ventral ribs versus 3 umbilical bullae are counted in a quarter whorl. The whorl shape is similar to that described above.

Still inner whorls are not preserved in the lectotype.

More specimens from the type locality are wanted to know the extent of variation of *Pachydiscus egertoni*. The true relationship between *P. egertoni* from the Indo-Pacific realm and *P. neubergicus* (HAUER) from Europe and other provinces should be made clear by a study of sufficient number of specimens on both sides. I have not yet looked at the lectotype of *Ammonites neubergicus*, but if I rely on the original description and illustration (HAUER, 1858, p. 12, pl. 2, figs. 1–2), it differs considerably from the lectotype of *A. egertoni* by more compressed and subelliptical, instead of suboval, whorl-section and more numerous ribs. The same distinction is maintained for the representatives of *P. neubergicus* in Madagascar (see COLLIGNON, 1971) and Western Australia (see HENDERSON and MCNAMARA, 1985). Incidentally, the holotype (BM. R 10464) of *Pachydiscus chrishna* (FORBES, 1846), from the Valudayur Group of Pondicherry (India), is closer to *P. neubergicus* than to *P. egertoni*, but it is somewhat more compressed ($B/H=0.69$) and its ribs show a characteristically concave curvature. Therefore, *P. chrishna* may be allied to but independent of *P. neubergicus*. Anyhow, more material from southern India is needed to lead a definite conclusion.

(2) *Ammonites ganesa* FORBES, 1846.

The figured syntype, BM.C.51042 [=“10465”] (FORBES, 1846, p. 103, pl. 7, fig. 8)

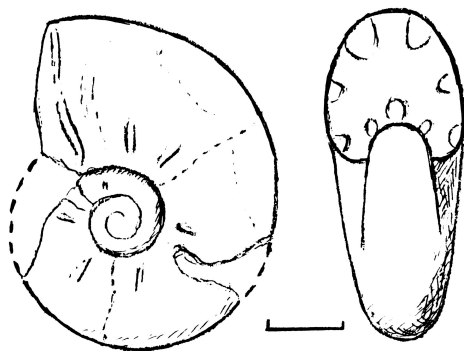


Fig. 3. Figured syntype of *Ammonites ganesa* FORBES.

Drawing in lateral and frontal views. This is probably an immature example of *P. egertoni*.

Scale bar = 10 mm.

(T. M. delin.)

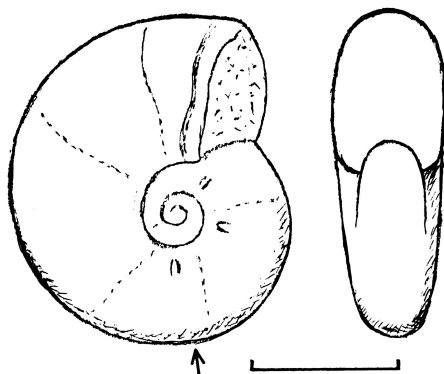


Fig. 4. Holotype of *Pachydiscus soma* (FORBES)
Drawing in lateral and frontal views. Arrow: position of the last suture.
Scale bar = 10 mm. (T.M. *delin.*)

(Fig. 3 in this paper) is small (see Table 2) but wholly septate. The outline of its whorl-section is similar to that of the lectotype of *A. egertoni*, although it is somewhat broader ($B/H=0.93$). Shell layers are preserved and there are umbilical bullae arranged at wide intervals, numbering 7 in a whorl. A weak rib is extended from the preserved last bulla and weakened at about the mid-flank. There are a few very narrow and weak, gently flexiradiate furrows which may be reduced constrictions or traces of apertural margin at periodic growth-stages. Despite the small size, the suture is finely and deeply incised.

I would agree with KOSSMAT (1898) in regarding *P. ganesa* as probably a young shell of *P. egertoni*, because they are from the same Valudayur Group, but this should be proved by the ontogenetic study of *P. egertoni* on suitable material.

(3) *Ammonites soma* FORBES, 1846.

The holotype, BM.C.51039 [= "10463"] (FORBES, 1846, p. 102, pl. 7, fig. 7) (Fig. 4 in this paper), is again from the Valudayur Group of Pondicherry. It is very small ($D=22.0$ mm; see also Table 2) and was regarded by STOLICZKA (1864) and KOSSMAT (1898) as a synonym of *A. ganesa*, which in turn was presumed as a young form of *P. egertoni*. My observation is different from them.

In this specimen the phragmocone ends at $D=ca$ 15 mm and the body-chamber is preserved for about 210° . The last half of the phragmocone has 3 umbilical bullae at wide intervals, of which the first 2 are distinct and the last one is rather blunt. There are also weak and narrow, periodic furrows, which are not distinct enough to be called constrictions but probably mark the periodic arrest of growth. On the body-chamber no umbilical bullae are developed but the periodic fine, radial furrows persist and there is a more distinct, somewhat flexuous constriction or flare near the preserved end. The last one may be a feature along the apertural margin. The outline of the whorl-section is dissimilar to that of *A. ganesa*, being more compressed and parallel sided.

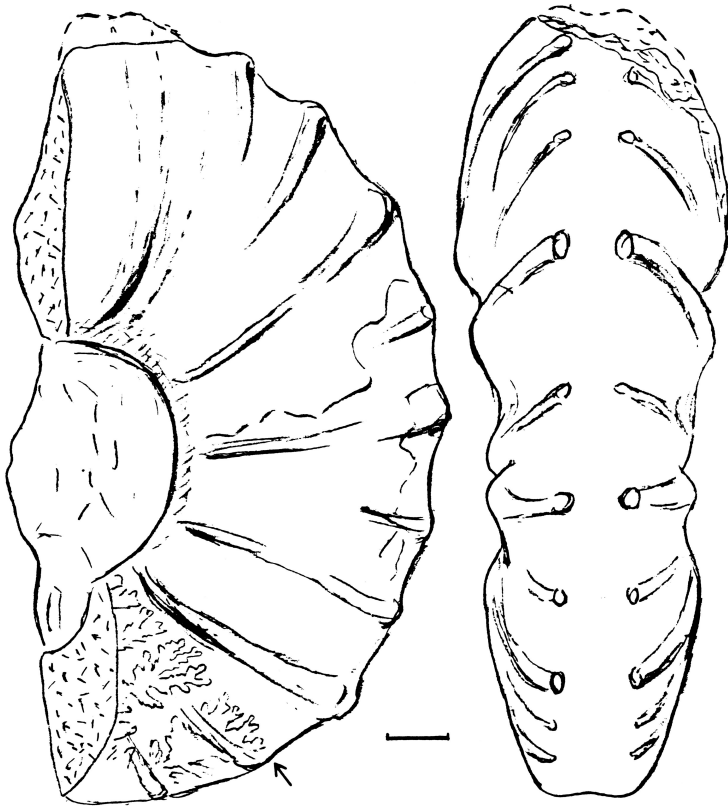


Fig. 5. Holotype of *Pseudomenites stoliczkai* MATSUMOTO sp. nov.

Drawing of GSI. 217 in lateral and ventral views.

Arrow: position of the last suture. Scale bar = 10 mm. (T. M. delin.)

I interpret that this is a peculiar dwarf species of *Pachydiscus*, as SPATH (1953, p. 39) has already suggested.

(4) *Ammonites egertonianus* of STOLICZKA, 1864 (pars).

STOLICZKA (1864, p. 104) seems to have understood *A. egertoni* too much comprehensively. This has given a misleading concept and geological age of *P. egertoni*. In my opinion, the specimen figured by STOLICZKA in pl. 53, figs. 1, 1a, from the Ariyalur Group of southern India, should be identified with *P. preegertoni* in every respect of observable characters. It resembles closely the specimen from Awaji described in this paper, although its B/H (see Table 2) is slightly smaller than ours and the intercalated shorter ribs disappear at somewhat earlier stage. The weakening of the ribs at about the middle of flank and on the siphonal zone, as seen in *P. egertoni*, does not occur in this specimen.

(5) *Pseudomenites stoliczkai* MATSUMOTO sp. nov.

Holotype: GSI. 217 (STOLICZKA, 1864, pl. 53, fig. 2, inadequate illustration) (Fig. 5 in this paper), from the Valudayur Group, which consists of the earlier 160° of body-chamber and the last part (about 20°) of phragmocone.

Diagnosis: Whorl somewhat higher than broad (see Table 2), broadest near the umbilical shoulder and subovoid to subtrapezoid in section, with flat siphonal zone between the rows of ventral tubercles. Distant long ribs, 5 in a half whorl, subradial to concave, each arising from the umbilical bulla. One or two or no (in one case) shorter, ventrolateral ribs on each interspace of the long ribs. In the observable part each rib ends at the ventral tubercle on either side of the siphonal zone. The ventral tubercles on primary ribs somewhat stronger than those on secondary ribs. The siphonal flat zone gradually narrowed with growth. Suture same as that of typical *Pachydiscus*.

Remarks: This was described by STOLICZKA under *Ammonites egertonianus*. It might form a dimorphic pair with *Pachydiscus egertoni*, but it is not so small as to be called microconch and whether they show commonly the same characters in the immature stage or not is uncertain. Moreover, secondary ribs do not persist to the late growth-stage in *P. egertoni*.

This species is somewhat similar to *Pseudomenuites haldemsi* (SCHLÜTER, 1867) from Europe, but is distinguished in having narrower and smoother interspace between the two rows of ventral tubercles and again more persistent secondary ribs.

Table 2. Measurements of selected specimens from India.

Specimen	Diameter	Umbilicus	Height	Breadth	B/H
(1)	104.0	29.0 (.28)	45.5 (.44)	38.5 (.37)	0.85
(2)	45.4	12.2 (.27)	20.4 (.45)	19.7 (.43)	0.93
(3)	22.0	5.5 (.25)	10.2 (.46)	8.5 (.39)	0.83
(4)	140.0	38.0 (.27)	59.0 (.42)	49.0 (.35)	0.83
(5)	129.0	39.0 (.30)	~55 (.41)	50.2 (.39)	0.91
(5) (−180° intercostal)			42.0	34.5	0.82

(1) to (5): specimens described under (1) to (5) in the text. ~: approximate.

Acknowledgements: We wish to thank Prof. Itaru HAYAMI of the University of Tokyo and Prof. Koichiro ICHIKAWA of Osaka City University for their kind offer of facilities to study the specimens kept at their care. Thanks are extended to Dr. M. K. HOWARTH and Mr. D. PHILLIPS of the British Museum (Natural History) [BM] and Mr. R. S. SASTRY, former Chief Palaeontologist of the Geological Survey of India [GSI.] for their kind help to the study of selected specimens by one of us (T. M.).

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Anaga 阿那賀, Awaji 淡路, Fukura 福良, Hokkaido 北海道, Honjo 本庄, Hyogo 兵庫, Ibi 伊比, Ikushumbets [Ikushunbetsu] 幾春別, Izumi 和泉, Kikume-zawa 菊面沢, Kita-ama 北阿万, Kobe 神戸, Mihara 三原, Mikasa 三笠, Minato 湊, Naruto 鳴門, Ryugase 龍ヶ瀬, Seidan 西淡, Shikoku 四国, Tokushima 徳島

淡路島産アンモナイト *Pachydiscus* の 1 種

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小沢は淡路島の地質巡検の際に、第1図に示した福良西方の道路切りからアンモナイトを得た。これについて研究した結果をここに報告する。この化石はその性状から *Pachydiscus preegertoni* COLLIGNON に同定される。和泉山脈産の *P. kobayashii* (SHIMIZU) は本種に類似するが、螺環がこれ程太くなく、B/Hの値が明確に小さいことと、成熟した殻がはるかに大きいことで識別される。*P. preegertoni* はマダガスカルのカンパニアン中部から産出するが、インド南部のAriyalur層群(カンパニアン)からも産し、さらに西南日本にも分布が広がることとなった。淡路での産出層位は北阿万層の下部(基底から約100m上位)であって、MOROZUMI (1985) が最近設定した *Pachydiscus awajiensis* 帯と *Nostoceras hetonaiense* 帯との中間に当たり、カンパニアン上部(そのかなり高い層準)と判断される。

本種の記載と関連して、従来日本とインドで *Pachydiscus egertoni* に同定されたことのあるアンモナイトについて、再研究の結果を付録として記した。まず、インドのValudayur層群から産する *P. egertoni* (FORBES) の後模式標本に見られる特性を明記した。次に *Ammonites ganesa* FORBES はこれの未成熟殻かもしれないが、*A. soma* FORBES はこれとは別の小型で特異な *Pachydiscus* の種であること、STOLICZKA (1984) が *A. egertonianus* としたAriyalur層群産の一部は *P. preegertoni* であり、他の一部は *Pseudomenuites* の新種を代表することなどを明らかにした。

今回の標本は九州大学に寄贈し、その石膏模型を大阪市立自然史博物館と兵庫教育大学に保管する。

Explanation of Plate 1

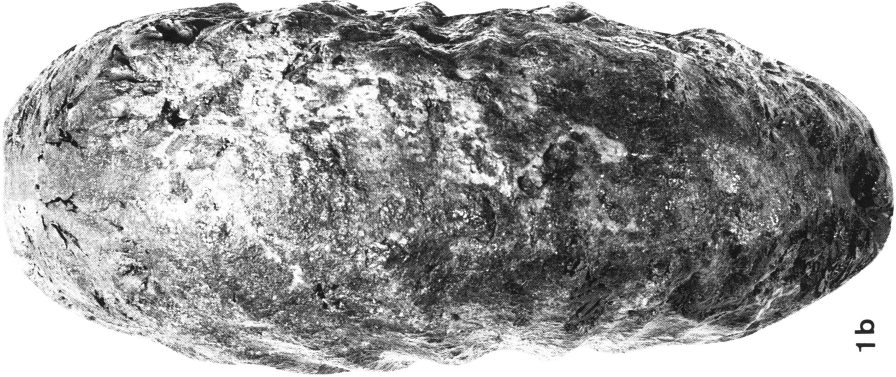
Fig. 1. *Pachydiscus preegertoni* COLLIGNON

GK.H8086, loc. on road-side about 4 km west of Fukura, lower part of the Kita-ama Formation.

Lateral (a), ventral (b) and frontal (c) views. Scale bar = 10mm.



1c



1b



1a

