

only species which it resembles in this respect being, I believe, *G. pusillus* of Meinert, from North Africa. It is undoubtedly very closely allied to the above-described *G. antipodum*, but differs in having a smaller number of legs, in being broader in the head, &c.

EXPLANATION OF PLATE XII.

- Fig. 1. *Henia athenarum*, sp. n. Head from below.
 Fig. 2. *Geophilus Grantii*, sp. n. Anal somite from below.
 Fig. 3. *Geophilus challengerii*, sp. n. Head from above.
 Fig. 3 a. Ditto. Head from below.
 Fig. 4. *Geophilus parthorum*, sp. n. Head from above.
 Fig. 4 a. Ditto. Anal somite from below.
 Fig. 5. *Geophilus sydneyensis*, sp. n. Head from above.
 Fig. 5 a. Ditto. Head from below.
 Fig. 5 b. Ditto. Anal somite from below.
 Fig. 6. *Geophilus laticeps*, sp. n. Head from above.
 Fig. 6 a. Ditto. Head from below.
 Fig. 7. *Geophilus morbosus* (Hutton). Head from above.
 Fig. 7 a. Ditto. Anal somite from below.
 Fig. 8. *Geophilus antipodum*, sp. n. Anal somite from below.
 Fig. 9. *Geophilus Huttoni*, sp. n. Head from above.
 Fig. 9 a. Ditto. Head from below.
 Fig. 9 b. Ditto. Anal somite from above.
 Fig. 10. *Geophilus provocator*, sp. n. Head from above.
 Fig. 10 a. Ditto. Head from below.
 Fig. 10 b. Ditto. Anal somite from below.
 Fig. 11. *Geophilus alacer*, sp. n. Head from below.
 Fig. 11 a. Ditto. Anal somite from below.
 Fig. 12. *Cryptops atlantis*, Pocock. Anal leg from the side.

XXVI.—*Remarks upon the Genus Pythina of Hinds and the Species which have been referred to it, upon Mysella of Angas, and the Description of a new Species of Mylitta.*
 By EDGAR A. SMITH.

[Plate XIII. A.]

(a) ON *PYTHINA*.

THE genus *Pythina* was established by Hinds in 1844 for a small triangular bivalved mollusk collected at New Ireland during the voyage of the 'Sulphur,' which is distinguished by a very peculiar kind of surface-ornamentation or sculpture, namely ribs or folds which extend from each end of the valves in an upward direction, meeting and divaricating at the

centre. Nothing is known of the animal of this interesting shell.

As many as nineteen so-called species have been described as belonging to this genus, or have been subsequently placed in it. Some of these do not possess the remarkable sculpture which characterizes the type, and differ also as regards the construction of the hinge. Others agree in having divaricate plications, but exhibit a widely different dentition.

I will now proceed to discuss each of these species, and will indicate the genus to which I think they should be referred.

1. *Pythina Deshayesiana*, Hinds.

1844. *Pythina Deshayesiana*, Hinds, Zool. Voy. 'Sulphur,' vol. ii. p. 70, pl. xix. figs. 8, 9.

1858. *Pythina Deshayesiana*, H. & A. Adams, Gen. Rec. Moll. pl. cxiv. figs. 9, 9 a.

1862. *Pythina Deshayesiana*, Chenu, Man. Conch. vol. ii. p. 126, fig. 603.

1878. *Pythina Deshayesiana*, Kobelt, Illust. Conchylienbuch, p. 352, pl. ciii. fig. 3.

Hab. New Ireland (*Hinds*); also Philippine Islands (*Cuming*, fide *Hinds*).

In my report upon the Lamellibranchiata of the 'Challenger' Expedition, p. 204, I have stated that the dentition of this species "is exactly that of *Kellia*"*, and that "the fact of the shell being divaricately plicate does not in my opinion entitle it to generic rank, but may be regarded of subgeneric importance." I have again critically examined this species, with the result that I am able to confirm the above observations, perhaps modifying the last statement respecting the relative value of sculpture in separating genera or subgenera. I am now inclined, in this instance, not to admit that it is even of subgeneric importance.

The dentition of this species is accurately defined by Hinds, H. & A. Adams, and Kobelt; but Chenu, in his 'Manual,' has described the hinge of *Mytilitta*, being under the impression that it was synonymous with *Pythina*. Hinds states that the pallial line is without any sinus; and on examining three specimens in the British Museum I find this to be correct, for the regular uninterrupted impression is clearly traceable from scar to scar. On the contrary, the existence of "a slight triangular sinus" is mentioned by H. & A. Adams and Kobelt. This error may have arisen through those authors obtaining their information from the description of *Mytilitta* (regarded by them as synonymous with *Pythina*) given by

* Stoliczka has restricted Lamarek's comprehensive genus *Erycina* and made it equivalent to *Kellia* (Palæont. Indica, vol. iii. p. 263).

d'Orbigny and Récluz, and not from actual examination of the species.

The ligament is mainly internal, oblique (as in *Kellia*), and posteriorly inclined and adjacent to the hinder tooth; a narrow linear extension of it borders the hinge-margins between the umbones. The lower internal margins of the valves are minutely denticulate, the denticles being rather stronger at the ends than in the middle. The entire external surface is minutely punctate, like some of the species of *Lepton*; but this feature is only visible under a powerful lens.

2. "*Pythina Deshayesii*, d'Orb. & Recl.," H. & A. Adams.
(Pl. XIII. A. fig. G.)

1844. *Erycina Deshayesii*, Récluz, Rev. Zool. 1844, p. 325.

1850. *Myllita Deshayesii*, d'Orbigny and Récluz, Journ. de Conch. 1850, p. 292, pl. xi. figs. 12-14.

1858. *Pythina Deshayesii*, d'Orb. & Recl., H. & A. Adams, Gen. Rec. Moll. vol. ii. p. 476.

1862. *Pythina Deshayesii*, Chenu, Man. Conch. vol. ii. p. 126, fig. 602.

1865. *Pythina Deshayesii*, d'Orb., Angas, Proc. Zool. Soc. 1865, p. 652.

1878. *Myllita Deshayesii*, Kobelt, Illust. Conchylienbuch, pl. ciii. fig. 11.

1875. *Pythina tasmanica*, Tenison-Woods, Proc. Roy. Soc. Tasman. 1875, p. 162.

1887. *Pythina tasmanica*, Tate, Trans. Roy. Soc. S. Austral. vol. ix. p. 98, pl. v. fig. 12.

Hab. New Holland (*Récluz*), Adelaide (*Brit. Mus.*), Rapid Bay, St. Vincent's Gulf, S. Australia (*Angas*), King's Island, N.W. of Tasmania (*Tenison-Woods*).

The fact of this remarkable shell having divaricate folds doubtless induced Messrs. Adams, Chenu, Tenison-Woods, and Tate to consider it congeneric with *Pythina*. It is quite evident that none of them had an opportunity of comparing the two hinges, or they would at once have perceived the difference. Still it is surprising that Messrs. H. and A. Adams should have made this mistake, for had they compared the description of *Myllita** given by d'Orbigny and Récluz with the specimens of *Pythina Deshayesiana* which they figured themselves, or even with Hinds's description of the hinge, they certainly would have held these genera distinct.

I feel convinced that d'Orbigny and Récluz have fallen into an error respecting the pallial impression. After a most careful examination of several valves of this and allied species I cannot discover a trace of the triangular sinus described by them.

* Inaccurately spelt *Myllita*, J. de Conch. 1850, p. 288.

It seems to me likely that an oblique scar across the interior of the valves, such as we find in many species of *Lucinidæ*, may have deceived them.

At present the systematic position of *Mytilitta* is doubtful; but considering the character of the exterior I am inclined to locate it provisionally in the above-named family.

3. *Pythina tasmanica*, Tenison-Woods.

Pythina tasmanica, Tenison-Woods, Proc. R. Soc. Tasman. 1875, p. 162;
Tate, Trans. R. Soc. S. Austral. vol. ix. p. 98, pl. v. fig. 12.

Hab. King's Island, N.W. of Tasmania.

This species is identical with the preceding, as indicated in the synonymy.

4. *Pythina Stoweii*, Hutton. (Pl. XIII. A. figs. D, E, F.)

1873. *Pythina Stoweii*, Hutton, Cat. Mar. Moll. New Zeal. p. 76.

1880. *Pythina Stoweii*, id. Manual N. Z. Moll. p. 157.

Hab. Islet Reef, Cook Strait, New Zealand (*Hutton*), New Zealand (*Dr. Sinclair*, in Brit. Mus. 1856).

This is a larger and narrower shell than *Mytilitta Deshayesii*, but agrees with it as regards the hinge. It is ornamented with strong divaricate plicæ, the entire surface being minutely shagreened or punctate.

5. *Pythina paula*, A. Adams.

Pythina paula, A. Adams, Proc. Zool. Soc. 1856, p. 47.

Montacuta paula, Smith, Report 'Challenger' Lamellib. p. 203, pl. xii. figs. 1-1 b.

Hab. Raine Island, Torres Straits (*A. Adams*), south of New Guinea ('*Challenger*').

This species has neither the dentition nor sculpture of *Pythina*, but agrees in both respects with *Tellimya*. I presume it was placed in *Pythina* mainly from its resemblance in form to the type of that genus and to the fossil *Modiola arcuata*, Lamk., referred to that genus by Hinds himself.

6. *Pythina peculiaris*, A. Adams.

Pythina peculiaris, A. Adams, Proc. Zool. Soc. 1856, p. 47.

Hab. Ceylon.

This so-called species, based on a single specimen in Cuming's collection, I regard as a mere distortion of *P. paula*.

7. *Pythina arcuata*, A. Adams.

Pythina arcuata, A. Adams, Proc. Zool. Soc. 1856, p. 47.

Hab. Zebu, Philippines.

This also, like the two preceding species, has the dentition of *Tellimya*, and should be referred to that group.

8. *Pythina triangularis*, A. Adams.

Pythina triangularis, A. Adams, Proc. Zool. Soc. 1856, p. 47, = *Mactra nucleus* (Conrad?), Reeve, Conch. Icon. 1854, fig. 102.

Hab. Manilla (A. Adams).

This small, almost equilaterally triangular species also has the dentition of *Tellimya*, agreeing in this particular precisely with the type, *T. bidentata*.

9. "*Pythina arcuata*, Lamarck," Hinds *.

Modiola arcuata, Lamarck, figured by Deshayes (Coq. foss. Environs Paris, vol. i. pl. xl. figs. 4, 5, 6), is stated by Hinds to belong to *Pythina*. It forms the type of the genus *Hindsia* of Deshayes, which was afterwards modified, on account of its preoccupation, to *Hindsiella* by Stoliczka. It possibly may be a species of *Montacuta* or *Tellimya*, as it appears to be in external appearance very closely allied to *T. paula* (A. Adams).

10. *Pythina mactroides*, Hanley.

Pythina mactroides, Hanley, Proc. Zool. Soc. 1856, p. 340.

Hab. Cape of Good Hope.

This little species is undoubtedly a *Kellia* both as regards the hinge and the smooth surface of the valves. I presume that Hanley was led to place it in the genus *Pythina* on account of the straight or even incurved ventral margin, which recalls the form of the type, *P. Deshayesiana*.

11. *Pythina nuculoides*, Hanley.

Pythina nuculoides, Hanley, Proc. Zool. Soc. 1856, p. 341.

Hab. Society Islands.

This species, which is synonymous with *Erycina denticulata*, Deshayes (Proc. Zool. Soc. 1855, p. 182), is in every respect a typical *Kellia*.

* This species is referred to merely on account of its having been quoted by Hinds as belonging to *Pythina*. Four other fossil species are placed in this group by Cossmann in his Cat. illustr. Coq. foss. Eocène Envir. Paris, 1887.

12. *Pythina striatissima*, Sowerby.

Pythina striatissima, Sowerby, Proc. Zool. Soc. 1865, p. 517, pl. xxxii. fig. 7.

Hab. Borneo.

This species has only a single anterior cardinal tooth in each valve, no posterior teeth or laterals. The internal ligament is oblique and posteriorly inclined.

Its position, judging from the dentition, is certainly with *Montacuta*, and not with *Pythina* (= *Kellia*), the hinge of which is quite different. This apparently is another instance in which the general form of the shell has influenced the describer in locating it.

13. *Pythina gemmata*, Tate.

Pythina gemmata, Tate, Trans. R. Soc. S. Australia, 1878, vol. ii. p. 132, pl. v. fig. 8.

Hab. Shell-sand, Fowler's Bay, South Australia.

This species is based on two minute right valves only, about $2\frac{1}{2}$ millim. in length, and it is possible they represent merely the young of some species which attains larger dimensions. It is sculptured with radiating granulous lines, somewhat like *P. striatissima*, but of course is generically distinct from that genus on account of the difference in the hinge. This is described by Tate thus:—"Right valve with a bifid cardinal tooth in front of a ligamental pit, laterals one on each side stout and elongated."

From this description it does not seem to correspond exactly with *Pythina*, but in my opinion more nearly approaches *Mylitta*; but without an examination of specimens it would be unsatisfactory to hazard a definite opinion.

14. "*Pythina setosa*, Dunker," Jeffreys.

Pythina setosa, Dunker, Jeffreys, Proc. Zool. Soc. 1881, p. 693.

Dr. Jeffreys is altogether wrong in his identification of this species, which was correctly described by Dunker as a *Coralliophaga* (vide Grube's 'Insel Lussin und ihre Meeres-fauna,' 1864, p. 48). He states that it "belongs to *Pythina* in respect of the hinge as well as of the peculiar divaricating structure," and he gives as synonyms *Kellia Macandrewi*, Fischer, *Scintilla recondita*, Fischer, and *Sportella Caillati*, Conti. The last two I do not know; but with regard to the first, I may observe that it has not the remotest resemblance to Dunker's species. This is a true *Coralliophaga*, has no

divaricating sculpture, the form of the genus *Modiola*, and is covered with a peculiar setose epidermis. A specimen from the 'Porcupine' expedition, presented to the British Museum by Dr. Jeffreys under the name of *Pythina setosa*, appears to be the young of *Kellia Macandrewi*, Fischer, which, according to the dentition, agrees with *Montacuta*, having only a distinct anterior tooth in each valve, the posterior one, which is more evident in *Tellimya*, being obsolete.

15. "*Pythina Geoffroyi*, Payraudeau," Jeffreys.

Pythina Geoffroyi, Payr., Jeffreys, Proc. Zool. Soc. 1881, p. 694.

Hab. Mediterranean, Atlantic.

This species has no divaricate sculpture and is usually located with the typical forms of *Kellia*.

16. *Pythina Cumingii*, A. Adams.

Pythina Cumingii, A. Adams, Proc. Zool. Soc. 1856, p. 47.

Hab. Island of Bohol, Philippine Islands.

This species has almost the same dentition as *Lepton*; indeed, the difference is so slight as to be of no importance. In *Lepton* the hinge is composed of a pair of teeth-like laminæ on each side of a central excision of the hinge-plate in the right valve; in the left there is a small cardinal in front of the cartilage-pit and on each side a single lateral which fits in between the laterals in the opposite valve. In the present species the small cardinal of the left valve is wanting or consolidated with the base of the anterior lateral. Another feature in which the present species agrees with *Lepton* is the fine punctuation which occurs on both the anterior and posterior dorsal areas, a feature unnoticed by Mr. Adams in his brief diagnosis.

17. *Pythina lævis*, Carpenter.

Pythina lævis, Carpenter, Cat. Mazatlan Shells, p. 112.

Hab. Mazatlan.

An examination of this species shows that it should be placed in *Tellimya* and that its nearest ally is *T. paula*, A. Adams. Carpenter correctly observes, "The character of the hinge seems more related to *Montacuta* than to *Kellia*." The elongate, very slender, lateral teeth he mentions are of no importance.

18. "*Pythina compacta*, Gould" (Tryon).

Kellia compacta, Gould, Proc. Boston Soc. Nat. Hist. 1861, vol. viii. p. 33; *Otia Conch.* p. 173.

Pythina compacta, Tryon, Proc. Acad. Nat. Sci. Philad. 1872, p. 232.

Hab. — ?

Respecting the hinge of this species Gould writes:—"Valvulæ alteræ dentibus duobus magnis, divergentibus, equalibus; alteræ marginibus dentibus simulantibus, elongatis; fossa ligamentali ampla." "Its hinge is like that of *Pythina*, Hinds. A knowledge of the animal can alone remove it definitely from the old genus *Kellia*."

From this two things are evident: firstly, that this species belongs to *Tellimya*, and, secondly, that Gould did not know *Pythina* nor the exact dentition of *Kellia*.

Tryon was probably induced to place this species in *Pythina* through Gould's statement respecting its similarity of dentition.

19. *Pythina rugifera*, Carpenter.

Pythina rugifera, Carpenter, Proc. Acad. Nat. Sci. Philad. 1865, p. 57.

Hab. Puget Sound, west coast of North America.

The hinge of this species is thus described by Carpenter:—"Dente cardinali uno minore, clavicula antica laterali inconspicua; laterali postico nullo." This description shows that the shell in question is quite distinct from *Pythina* (= *Kellia*). Without seeing a specimen it is impossible to state its true position; but temporarily I suggest its location in *Montacuta*, from the fact of there being no posterior teeth.

Conclusions.

From a perusal of the preceding observations it will be seen—

- (1) That the so-called genus *Pythina* differs from *Kellia* only in having the surface ornamented with divaricating plicæ, a feature, in my judgment, only of specific value.
- (2) That it is restricted to one species, namely *P. Deshayesiana* of Hinds.
- (3) That the eighteen other species which have been located in *Pythina* should, according to their conchological characters, be thus classified:—

" <i>P. Deshayesii</i> , Récluz "	(H. & A. Adams),	in <i>Mylitta</i> .
<i>P. tasmanica</i> , Ten.-Woods	.	in <i>Mylitta</i> .
<i>P. Stowei</i> , Hutton	.	in <i>Mylitta</i> .
<i>P. gemmata</i> , Tate	.	in <i>Mylitta</i> ?
<i>P. mactroides</i> , Hanley	.	in <i>Kellia</i> .
<i>P. nuculoides</i> , Hanley	.	in <i>Kellia</i> .
" <i>P. Geoffroyi</i> , Payr. (Jeffreys) "	.	in <i>Kellia</i> .
<i>P. paula</i> , A. Adams	.	in <i>Tellimya</i> .
<i>P. peculiaris</i> , A. Adams	.	in <i>Tellimya</i> .
<i>P. lævis</i> , Carpenter	.	in <i>Tellimya</i> .
<i>P. arcuata</i> , A. Adams	.	in <i>Tellimya</i> .
<i>P. triangularis</i> , A. Adams	.	in <i>Tellimya</i> .
" <i>P. compacta</i> , Gould " (Tryon)	.	in <i>Tellimya</i> .
" <i>P. arcuata</i> , Lamk." (Hinds)	.	in <i>Tellimya</i> ?
<i>P. striatissima</i> , Sowerby	.	in <i>Montacuta</i> .
<i>P. setosa</i> , Jeffreys (non Dunker)	.	in <i>Montacuta</i> .
<i>P. rugifera</i> , Carpenter	.	in <i>Montacuta</i> ?
<i>P. Cumingii</i> , A. Adams	.	in <i>Lepton</i> .

(b) ON *MYSELLA*.

This genus was created by Angas for a small Australian bivalve and described in the Proc. Zool. Soc. 1877, p. 176. The description he gives of the hinge is inaccurate in more respects than one. In one valve, which I take to be the left, he mentions "a single small, diverging, subcircular, flattened cardinal tooth." This is posterior to the triangular cartilage-pit beneath the umbo. It certainly cannot be called "subcircular," for the upper side of it is almost straight and the lower gently curved. In addition to this there is a second but much smaller tooth on the anterior side of the cartilage-pit, entirely overlooked by Mr. Angas. The right valve has the hinge-margin on each side the umbo produced, forming teeth as it were, which fit in above those of the opposite valve.

I have carefully studied the types of *Mysella anomala*, Angas, and *Mysella donaciformis*, Angas, kindly presented to the British Museum by that author, and I fail to discover any reasons for separating them from the genus *Tellimya*. The fact of the cartilage-pit being more visible and more triangular than in the type of the genus, *T. bidentata*, is of no importance, and merely what we might expect in larger species like those.

(c) DESCRIPTION OF A NEW SPECIES OF *MYLITTA*.*Mylitta auriculata*, sp. n. (Pl. XIII. A. figs. A, B, C.)

Testa subcircularis, æquilateralis, superne utrinque umbones auriculata, auriculis tenuibus, excurvatis, alba, mediocriter convexa; valvæ crassæ, umbones versus sublæves, deinde usque ad marginem radiatim fortiter costatæ, costis subacutis, prominentibus, inter costas concentrice rugose striatæ, vel tenuissime lamellatæ; umbones parvi, acuti, antrorsum curvati; dens cardinalis unicus valvæ dextræ parvus, conicus, laterales duo utrinque sed prope umbonem validi, divergentes; dens cardinalis valvæ sinistræ bifurcatus, lateralis unicus utrinque prominens, crassus; fossa ligamenti profunda, mediana, subtriangularis, pone dentem cardinalem sita; pagina interna radiatim sulcata, ad marginem valde crenulata, ad extremitates costarum breviter incisa; cicatrices parvæ, subrotundæ, et linea pallii simplex.

Longit. 8 millim., alt. $6\frac{1}{2}$, diam. $3\frac{1}{4}$.

Hab. Tasmania.

In solidity, colour, and dentition this very remarkable shell agrees exactly with the type of *Mylitta*, but differs from it in having the superficial costæ arranged in a radiating instead of a divaricating manner. This difference, as in the case of *Pythina* with regard to *Kellia*, I regard merely of specific importance.

The valves, when viewed inside with the umbo upward, recall the aspect of a bat, the outwardly recurved auricles representing the ears.

The three valves upon which this description is based have been presented to the British Museum by Mr. J. H. Ponsonby. He informs me that he received them from Tasmania under the name of *Pythina Deshayesii*, and therefore it seems likely that this form is wrongly recognized there as that described by Récluz.

EXPLANATION OF PLATE XIII. A.

- | | | |
|---------|-----------------------------|------------------------|
| Fig. A. | <i>Mylitta auriculata</i> . | Left valve, interior. |
| Fig. B. | " " | Right " " |
| Fig. C. | " " | Left " exterior. |
| Fig. D. | <i>Mylitta Stowei</i> . | Left valve, interior. |
| Fig. E. | " " | Right " " |
| Fig. F. | " " | " " exterior. |
| Fig. G. | <i>Mylitta Deshayesii</i> . | Right valve, exterior. |



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