

it. I do not now think that we have any ground to call the embryos of the *Blattæ* "apodal and acephalous larvæ, like the maggot of the Fly," nor to hold that they "pass, in the egg, through stages answering to those at which other insects are arrested." I also doubt very much the fact that at any stage "its thirteen segments were distinct and equal." I can only say that, in my specimens at the epoch at which figure 2 was taken, the segments must have been at their earliest stage, for they were in some absolutely undistinguishable; and yet, in all, the long legs were by that time developed; and when the segments could be distinguished, they were by no means equal, the thoracic segment occupying its proper proportion—nearly a third of the whole.

There yet remains another supposition, which may perhaps be the true one, viz. that Professor Owen has founded his conclusions on the general physiological principles of development, as modified by erroneous observations, arising from either of the sources of error I have above indicated.

On the Species of *Fusidæ* which inhabit the Seas of Japan.

By ARTHUR ADAMS, F.L.S., &c.

[Read March 19, 1863.]

THE species of Fusoid Gasteropods are tolerably numerous in the seas of Japan. In the north I found many of the large *Neptunæ*, which in the south are represented by the group I have named *Siphonalia*. In the southern parts also linger a *Cominella* and a few *Euthriæ*. No species of *Fusus* proper was found by me further north than Tsuka Strait. *Hemifusus tuba*, used as a fog-horn by the fishermen, was observed from Tsu-Sima in the south to Hakodadi in the north.

The genus *Siphonalia*, A. Ad., will be found described, and twenty-one species enumerated, in the 'Annals and Magazine of Natural History' for March 1863.

1. Genus *HEMIFUSUS*, Swains.

1. *Hemifusus tuba*, Gmel. (*Murex tuba*, Gmel.—*Fusus tuba*, Enc. Méth.—*Pyrula tuba*, Lam.—*Cochlidium tuba*, Gray.)
Hab. Tatiyama; Hakodadi; Tsu-Sima; Nagasaki.

2. Genus *FUSUS*, Klein.

1. *Fusus crebriliratus*, Reeve, *Conch. Icon.* sp. 20.
Hab. Tatiyama; Okino-Sima.
2. *Fusus Novæ-Hollandiæ*, Reeve, *Conch. Icon.* sp. 70.
Hab. Tatiyama; Hakodadi.

3. *Fusus Beckii*, *Reeve, Conch. Icon.* sp. 34.*Hab.* Tomo ; Seto-Uchi.4. *Fusus pagoda*, *Lesson, Illust. de Zoologie*, pl. 40. ; *Rve. Conch. Icon.* sp. 32.*Hab.* Kiusu.5. *Fusus gracillimus*, *Adams & Reeve, Moll. Voy. Sam.* ; *Rve. Conch. Icon.* sp. 69.*Hab.* Tsaulian, 6 fathoms.6. *Fusus fragosus*, *Reeve, Conch. Icon.**Hab.* Tsu-Sima.7. *FUSUS PERPLEXUS*, *A. Ad.*

F. testa fusiformi, tenui, turrita, alba, rufo tincta ; anfractibus 7, convexis, longitudinaliter obsolete plicatis, transversim liratis, liris acutis æqualibus undulatis, lineis elevatis filiformibus alternantibus, liris transversis subnodulosis in medio anfractuum instructis ; apertura ovata, canali aperto ; rostro recto, crasso, apertura longiore.

Hab. Tatiyama.

A species of ordinary form and sculpture, but which I am unable to refer to any already described.

8. *FUSUS SOLIDULUS*, *A. Ad.*

F. testa fusiformi, solida, albida, rufo tincta ; anfractibus 8, ad suturas excavatis, convexis, longitudinaliter valde plicatis, plicis rotundatis, regularibus, transversim liratis, liris granulosis inæqualibus, interstitiis subcancellatis ; apertura ovata, canali aperto, rostro brevi, crasso, reflexo, ad extremitatem truncato et vix dilatato.

Hab. Tomo.

A stout, solid species, with a short, wide, truncate beak and strongly plicate convex whorls.

3. GENUS *PRIENE*, *H. & A. Ad.*

1. *Priene cancellata*, *Lam.* (*Triton cancellatum*, *Lam. Hist. An. s. Vert.* vol. ix. p. 638.—*Fusus cancellatus*, *Rve. Conch. Icon.* sp. 62.—*Tritonium* (*Buccinum*) *cancellatum*, *Midd.*)

Hab. Rifunsiri, Aniwa Bay.

2. *Priene Oregonensis*, *Say.* (*Triton Oregonense*, *Say, Ann. Lyc. Nat. Hist.* vol. iv. p. 165.—*Fusus Oregonensis*, *Rve. Conch. Icon.* sp. 61.)

Hab. Okosiri, 35 fathoms ; Aniwa Bay.4. GENUS *NEPTUNEA*, *Link.*

1. *Neptunea antiqua*, *Linn.* (*Murex antiquus*, *Linn., Rve. Conch. Icon. Fusus*, sp. 44.—*Tritonium antiquum*, *Müll.*—*Fusus bubaceus*, *Bernardi, Journ. de Conch.* tom. vii. pl. 7. f. 1.—“*Nisi*” in *Japanese.*)

Hab. Aniwa Bay ; Hakodadi.

2. *Neptunea fornicata*, *Fabr.* (*Tritonium fornicatum*, *Fabr.*—*Fusus fornicatus*, *Gray, Beechey's Voy.* p. 117 ; *Rve. Conch. Icon. Fusus*, sp. 63.)

—T. Behringianum, *Midd.*—*Fusus arthriticus*, *Fisch. Journ. de Conch.* 1857, pl. 12. f. 3.—*Fusus Cumingii*, *Crosse, Journ. de Conch.*)

Hab. Aniwa Bay; Rifunsiri; Hakodadi; Gulf of Tartary.

3. *Neptunea despecta*, *Linn.* (*Murex despectus*, *Linn.*—*Fusus despectus*, *Rve. Conch. Icon. Fusus*, sp. 39.—*Fusus carinatus*, *Lam.*—*Murex carinatus*, *Penn.*—*Fusus tornatus*, *Gould.*—*Tritonium despectum*, *Fabr.*)

Hab. Aniwa Bay; Rufunsiri.

4. *Neptunea æstuosa*, *Gould, Otia Conch.* p. 123.

Hab. Kagosima.

5. *NEPTUNEA LURIDA*, *A. Ad.*

N. testa ovato-ventricosa, cretacea aut sordide alba, epidermide fusca tenui oblecta, spira apertura brevior; anfractibus $4\frac{1}{2}$, convexis, ultimo obtusim postice subangulato; apertura ampla, ovata, intus livida; labio lævi, convexo, canali brevissimo aperto vix reflexo; labro intus lirato, prope marginem lævi, postice late subsinuato.

Hab. Aniwa Bay; Cape Tofuts.

This is the common edible Whelk of the Ainos. I cannot refer it to any of the varieties of *N. antiqua* mentioned by Middendorff, most of which, as mentioned above, also occur in Northern Japan.

Subgenus SIPHO, *Klein.*

1. *Sipho Sabinii*, *Gray.* (*Buccinum Sabinii*, *Gray, Suppl. to App. Parry's Voy.* 1824, p. 240.—*Fusus Sabinii*, *Gray, Zool. Beechey's Voy.* 1839, p. 117.—*Fusus Bernicensis*, *King, Ann. & Mag. Nat. Hist.* 1846, p. 246.)

Hab. Aniwa Bay, 17 fathoms.

2. *Sipho dilatatus*, *Quoy & Gaim.* (*Fusus dilatatus*, *Quoy & Gaim. Voy. de l'Astr. Zool.* pl. 34. f. 15-17; *Rve. Mon. Fusus*, sp. 49.—*Fusus adustus*, *Phil.*)

Hab. Tsu-Sima.

3. *SIPHO PLICATUS*, *A. Ad.*

S. testa fusiformi, subturrita, sordide alba, epidermide pallide fusca oblecta, spira apertura longior; anfractibus 9, longitudinaliter valde plicatis, plicis distantibus, æqualibus, interstitiis transversim sulcatis; apertura trigonali-ovata; labio lævi, arcuato, canali mediocri lato vix recurvato; labro acuto, margine postice late sinuato.

Hab. Saghaleen; Aniwa Bay, 16 fathoms.

Fusus cretaceus, *Reeve*, is the only shell at all resembling this species. The spire is very elevated, and the whorls are strongly plicate.

5. Genus COMINELLA, *Gray.*

1. *COMINELLA FUCATA*, *A. Ad.*

C. testa acuminato-ovata, sordide grisea, fusco fulvoque fucata, spira brevi, conoidali; anfractu ultimo subventricoso; anfractibus 5, planis, postice coarctatis, suturis corrugato-plicatis transversim striatis; aper-

tura ovata, ampla; labio lævi, postice calloso, antice subplanulato; labro effuso, intus valde sulcato, margine crenulato.

Hab. Japan; Coll. Cuming.

Except in the form of the outer lip, which is very effuse, this species is of the ordinary form. The colour is dingy grey, stained here and there with fuscous.

6. Genus EUTHRIA, Gray.

1. *Euthria plumbea*, Phil. (*Fusus plumbeus*, Phil. *Abild. der neuen &c. Conch.* pl. 1. f. 3.—*Buccinum ferreum*, Reeve, sp. 102.—*Fusus viridulus*, Dkr. *Moll. Japan*, pl. 1. f. 16.)

Hab. Tsu-Sima; O-Sima; Nagasaki.

2. *EUTHRIA BADIA*, A. Ad.

E. testa fusiformi, badia, spira aperturam æquante; anfractibus $6\frac{1}{2}$, convexiusculis, prope suturas excavatis, longitudinaliter plicatis, plicis undulosis, convexis, distantibus, transversim liratis, liris granulosis inæqualibus; apertura acuminato-ovata, intus livida; labio postice transversim rugoso, canali mediocri, ad sinistram inclinato recurvato; labro intus valde sulcato, margine postice sinuato et coarctato.

Hab. Tsu-Sima.

A brown fusiform species, with the aperture of a livid colour, the whorls plicate and transversely lirate, and with the outer lip internally strongly sulcate.

3. *EUTHRIA LIRATA*, A. Ad.

E. testa fusiformi, rubro-castanea, spira apertura longiore, nucleo permagno; anfractibus 6, convexiusculis, cingulis transversis planis æquidistantibus æqualibus succinctis, interstitiis valde impressis, longitudinaliter crebre striatis; apertura acuminato-ovata; labio lævi, rotundato, canali producto, ad dextram inclinato, subtortuoso, vix reflexo; labro simplici.

Hab. Tsusaki.

A fusiform, reddish-chestnut species, with the whorls encircled with regular, flat, concentric ridges.

7. Genus CANTHIRIDUS, Montf.

1. *Canthiridus erythrostomus*, Reeve. (*Buccinum erythrostoma*, Reeve, *Conch. Icon.* sp. 14.)

Hab. O-Sima.

2. *Canthiridus Cumingianus*, Dkr. (*Buccinum Cumingianum*, Dkr. *Malak. Blätt.* July 1846.—*Buccinum ligneum*, Reeve, sp. 57.)

Hab. Seto-Uchi.

Subgenus TRITONIDEA, Swains.

1. *Tritonidea Proteus*, Reeve. (*Buccinum Proteus*, Reeve, sp. 51.)

Hab. Tsu-Sima.

2. *Tritonidea balteata*, Reeve. (*Buccinum balteatum*, Reeve, sp. 59.)

Hab. Tatiyama.



Adams, Arthur. 1863. "On the Species of Fusidae which inhabit the Seas of Japan." *Journal of the proceedings of the Linnean Society* 7(26), 105–108.
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