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Discovery of Triassic Conodonts from the So-called Palaeozoic Limestone in Kedah, Malaya*

(Notes on the Geology and Palaeontology of Malaya-I)

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(With 1 Plate)

Near Kodiang railway station in Kedah, Northwest Malaya several limestone hills are distributed above the plain. They are called Bukit Hantu, Bt. Kechil, Bt. Kalong, Bt. Kodiang, Bt. Kechil, Bt. Mutong and Bt. Kepelu, respectively, from the southwest to the northeast. These limestones have hitherto been regarded as Permian in age. At the beginning of 1965, Ishii collected samples of limestone from Bt. Kalong and Bt. Kechil (the southern one of the two similarly named hills). Triassic conodonts were discovered from the samples. This first discovery of the Triassic conodonts from the western part of Malaya is preliminarily reported here. A detailed description will be given in the near future.

Brief Note of Geology

1) Bukit Kechil (loc. M7), near Kodiang railway station in Kedah

The base of the hill is composed of mudstone (2m+thick), but the main parts are composed of white, intrasparitic limestone, which yields occasionally calcareous algae, bivalves and foraminifera. The limestone has a strike of N 50-80° W and dips 10-20° towards NE.

About 2.5 kg samples of limestone were collected at a quarry (loc. M7) on the hill and were dissolved in 12-13 % acetic acid. As a result, about 30 conodonts have been obtained.

2) Bukit Kalong (loc. M16), near Kodiang railway station in Kedah.

The hill is composed of three parts : the lower part, of white and intrasparitic limestone (about 15 m thick), the middle part, of alternation of micritic limestone and chert (10m+thick), and the upper part, of brecciated intrasparitic limestone (20m+thick). The limestone and chert have a general strike of N 30° W and dip 20-30° towards NE.

About 2.0 kg samples of limestone from the lower part were dissolved in 12-13 % acetic acid, from which about 100 conodonts have been secured.

General Characteristics of Conodont Faunules

Two Triassic faunules of conodonts are now obtained from Western Malaya,

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Gladigondolella cf. *abneptis* faunule from Bt. Kechil and *Gladigondolella tethydis* faunule from Bt. Kalong.

1) *Gladigondolella* cf. *abneptis* faunule

The faunule is constituted from the following elements.

	number of specimens
Gladigondolella cf. *abneptis* (HUCKRIEDE)	7
Gondolella navicula HUCKRIEDE	2
"*Apatognathus*" *ziegleri* DIEBEL	3
Diplododella lautissima (HUCKRIEDE)	1
D. *meissneri* (TATGE)	2
D. sp. indet.	1
"*Hindeodella*" *petrae-viridis* HUCKRIEDE	3
"*H.*" *triassica* MÜLLER	8

Among these elements *G.* cf. *abneptis* and *G. navicula* are important as horizon markers. *G.* cf. *abneptis* is closely allied to the type specimen of *G. abneptis*, but it differs slightly from the latter in having a more weakly ornamented platform. *G. abneptis* was first described by DIEBEL (1965b) as *Polygnathus* n. sp. from the Upper Cretaceous in Kameron, Africa, and then it was named *Polygnathus abneptis* by HUCKRIEDE (1958) who reported it from the Carnian to Norian of the Alps. The form belongs, however, to the genus *Gladigondolella*, which is proposed by MÜLLER (1962) with *Polygnathus tethydis* as the type species.

According to HUCKRIEDE (1958) *Gondolella navicula* shows rather wide individual variation and occurs from the upper Anisian to the Carnian. An illustrated specimen in Pl. 1, fig. 6a–c, is regarded as advanced type and identical with the type specimen (HUCKRIEDE, 1958, pl. 12, fig. 18–20).

Other elements of the faunule are characteristic of the Triassic, except for "*Apatognathus*" *ziegleri*, which occurs also in the Upper Cretaceous. Therefore, it can be presumed, in general consideration, that the present faunule belongs to the Late Triassic. It cannot be certainly concluded, since not a single reference to the Jurassic and Lower Cretaceous conodonts has ever appeared. Anyhow the Mesozoic age of the faunule is conclusive.

2) *Gladigondolella tethydis* faunule

The faunule is constituted from the following elements.

	number of spdcimens
Gladigondolella tethydis (HUCKRIEDE)	2
Gondolella navicula HUCKRIEDE	about 25
Spathognathodus cf. *cristagalli* HUCKRIEDE	2
Diplododella meissneri (TATGE)	5
D. n. sp.	1
D. sp. indet.	2
"*Hindeodella*" *multihamata* HUCKRIEDE	3
"*H.*" *petrae-viridis* HUCKRIEDE	about 15
"*H.*" *triassica* MÜLLER	about 30
Lonchodina mülleri TATGE	1

Neoprioniodus cf. *kochi* (HUCKRIEDE) 2
Ozarkodina saginata HUCKRIEDE 2
O. sp. indet. 4

Among these elements *Gladigondolella tethydis* and *Gondolella navicula* are characteristic as horizon markers. The specimen of *G. tethydis* illustrated in pl. 1, fig. 1a-c, is almost identical with the holotype from the lower Carnian. According to HUCKRIEDE (1958), *G. tethydis* occurs from the upper Anisian to the Carnian. *G. navicula* of the present faunule is less advanced than that of *Gladigondolella* cf. *abneptis* faunule. Therefore, the faunule of conodonts from the Bt. Kalong is older than that from B. Kechil and belongs to the Middle to Late Triassic period.

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Plate I

Explanation of Plate 1

all specimens × about 25

Fig. 1, 2. *Gladigondolella tethydis* (HUCKRIEDE)
1. representative specimen from Bt. Kalong, loc. M16, a) upper view, b) oblique lateral view, c) lower view.
2. small specimen from Bt. Kalong, loc. M16, a) oblique upper view, b) lateral view.

Fig. 3-5. *Gladigondolella* cf. *abneptis* (HUCKRIEDE)
3. intermediate specimen between *G. abneptis* and *G. mungoensis*, from Bt. Kechil, loc. M7, upper view.
4. representative specimen from Bt. Kechil loc. M7, a) oblique upper view, b) lower view.
5. small specimen from Bt. Kechil loc. M7, a) lateral view, b) oblique lower view.

Fig. 6-8. *Gondolella navicula* HUCKRIEDE
6. advanced specimen from Bt. Kechil loc. M7, a) upper view, b) oblique lateral view, c) lower view.
7. less advanced form from Bt. Kalong loc. M16, a) upper view, b) oblique lateral view, c) lower view.
8. primitive specimen from Bt. Kalong loc. M16, a) upper view, b) laterl view, c) oblique lower view.

Fig. 9, 10. *Spathognathodus* cf. *cristagalli* HUCKRIEDE
9. from Bt. Kalong loc. M16, inner lateral view.
10. from Bt. Kalong loc. M16, outer lateral view.

Fig. 11. *Ozarkodina saginata* HUCKRIEDE
from Bt. Kalong loc. M16, inner lateral view.

Fig. 12. *Neoprioniodus* cf. *kochi* (HUCKRIEDE)
from Bt. Kalong loc. M16, inner lateral view.

Fig. 13. "*Hindeodella*" *triassica* MÜLLER
from Bt. Kalong loc. M16, inner lateral view.

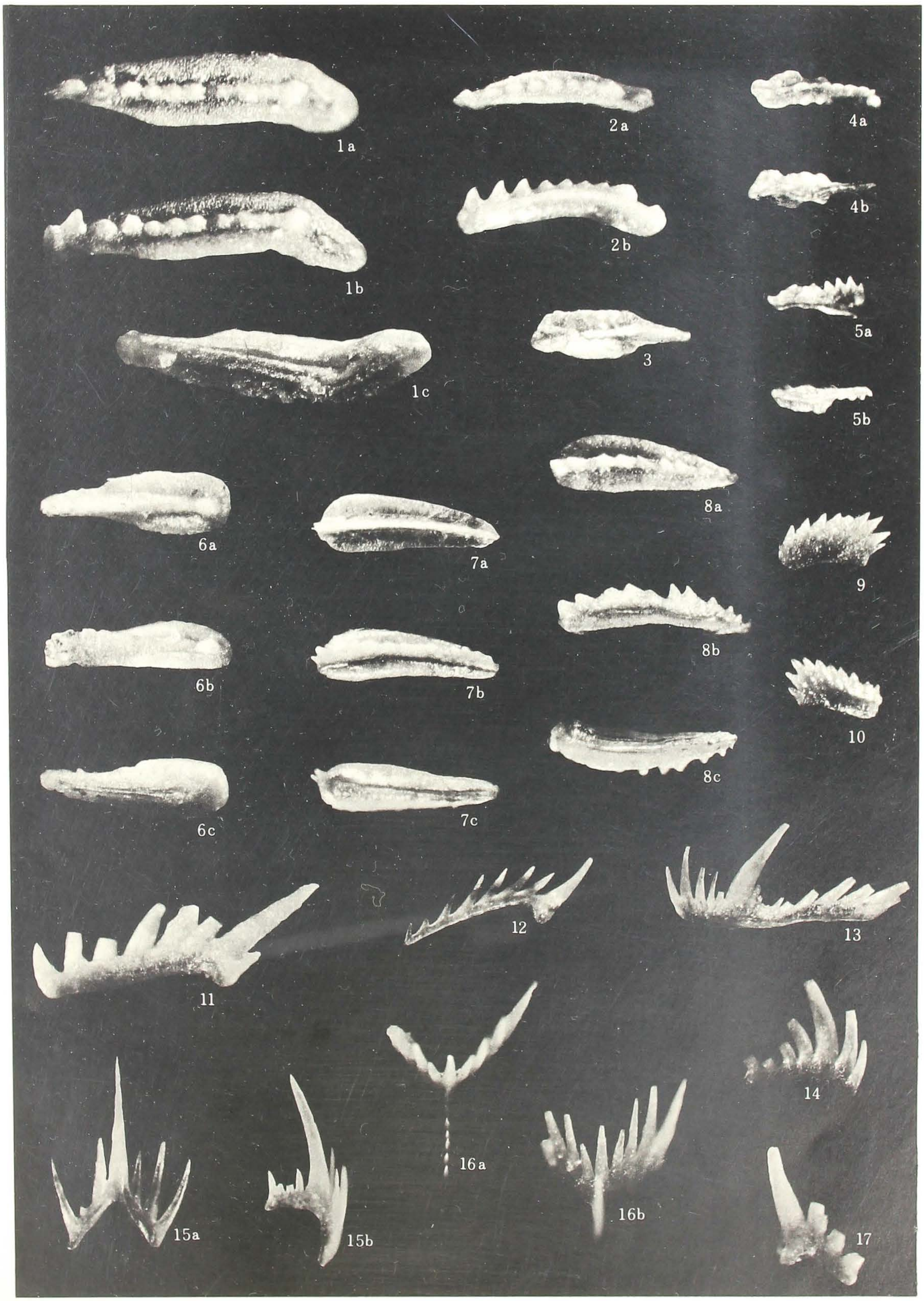
Fig. 14. "*Hindeodella*" *petrae-viridis* HUCKRIEDE
from Bt. Kalong loc. M16, outer lateral view.

Fig. 15. *Diplododella lautissima* (HUCKRIEDE)
representative form from Bt. Kechil loc. M7, a) inner view, b) lateral view.

Fig. 16. *Diplododella* n. sp.
from Bt. Kalong loc. M16, a) upper view, b) oblique inner view.

Fig. 17. *Lonchodina mülleri* TATGE
from Bt. Kalong loc. M16, inner view.

Photos NOGAMI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