323. SOME NOTES ON A RARE SPECIES TRICERATIUM
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Introduction

Since 1951-1955, I had an opportunity to examine many boring cores for oil
prospecting of the Teikoku oil company, and I made a special study of fossil
diatoms in the cores. But I did not found a rare species of the above heading.
In July 15, 1954, Mr. II. SUMBO who was an oil engineer at that time
sent me some unknown specimens collected from the core of the Iwata test
boring R-1. Thereafter, in July 9, 1956, he again sent me same specimens, some
of which are collected from a core of the Itsuka-machi test boring R-1.

Such a form is rarely to be met with, in microorganisms of our country, so
I would like to put down my observations concerning this rare form.

I wish to express my thanks for Mr. II. Shimbo, who has sent me the best
specimens in his collections.

Geological Consideration

The geology of the Japanese oil field has been discussed by many geologists,
and they have paid particular attention to the occurrence of various sorts of
black shale and mudstone. Some microfossils as diatoms, pollens, sponge
spicules, etc. broadly occur in these muddy beds.

Mr. Shimbo assigns that the age of these beds from which the specimens
were collected belongs to a period from the Upper Miocene to the Lower
Pliocene, showing the following table:

<table>
<thead>
<tr>
<th>Age</th>
<th>Formation, Member, Bed</th>
<th>Well</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pliocene</td>
<td>Hamatsuda alternation member or Lower part of Nishiyama formation</td>
<td>Iwata R-1</td>
<td>391.50 m</td>
</tr>
<tr>
<td>Miocene</td>
<td>Nunagawa beds or Upper part of Siiya formation</td>
<td>Itsuka-machi R-1</td>
<td>452.00 m</td>
</tr>
<tr>
<td></td>
<td>Teradomari formation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nanatani formation</td>
<td>Itsuka-machi R-1</td>
<td>543.00 m</td>
</tr>
</tbody>
</table>

* Read Feb. 9, 1956; received Dec. 26, 1956.
The Iwata test boring R-1 situates on the south-western vicinity of Nagaoka City, Niigata-prefecture. The specimens are collected from part of the core of 391.50 m in depth, which geologically belongs to the Hamatsuda alternation member (or Lower part of Nishiyama formation).

The Itsuka-machi test boring R-1 lies in the northern part of Uonuma-subprefecture, Niigata-prefecture. Some of these specimens were collected from a core of 452.00 m in depth, which belongs to the Nunagawa beds (or Upper part of Siya formation), and the other was collected from a core of 543.00 m in depth, which belongs to the Teradomari formation.

Generally speaking, the specimens are frequently found in the Hamatsuda member and the Nunagawa beds. But in other places, they are only found near boundaries of each formation.

Description

The outline of the frustules of diatoms takes varied forms. Among them, triangular forms can be separated as one group from all their allies, and it is also distinguished by the absence of a pseudonodules from them. Such a genus is called *Triceratium*. To ascertain the true form and structure of the valve requires a careful examination, not only of living, but of fossil specimens. But in some of fossil forms, true characters of their skeleton can not easily be understood. I think it is almost the same with the present case.

The form described here is perhaps derived from the triangular form of the valve, and the three-lobes radiating from the center of an equilateral triangle well develop into the skeleton and the other part of the triangle waste away into nothing (Pl. 18; figs. 5, 6). But in some specimens, all parts of the triangle remain to the last (Pl. 18; figs. 1, 2). If the test is put back in its original form, it will show a triangle form as the structure of the valve. The one side of the triangular form measures 100 to 160 μ in length.

This form also differs from other triangular species except *Triceratium* such as *Schutta annulata* (Wall.) De Toni, *Trinacria regina* Heib., and *Frugiaria construens* (Ehr.) Grun. var. *exigua* (W. Smith) Schulz, in absence of characteristic markings of its valve and size of species.

This genus, as the name implies, is characterized by a triangular form of its valve, and the markings on the valve are very important for determination.

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Explanation of Plate 18

*Triceratium simplex* J. Brun

Figure 1. Triangular form...........In the core of the Iwata R-1 (391.50 m).

Figure 2. Triangular form...........In the core of the Itsuka-machi R-1 (543.00 m).

Figure 3. Intermediate form...........In the core of the Iwata R-1 (391.50 m).

Figure 4. Intermediate form...........In the core of the Itsuka-machi R-1 (542.00 m).

Figure 5. Triple-headed form.......In the core of the Iwata R-1 (391.50 m).

Figure 6. Triple-headed form.......In the core of the Iwata R-1 (391.50 m).

All specimens are preserved in the collection of Faculty of Science, Kanazawa University.
Some Notes on a Rare Species *Triceratium Shimplex* J. Brun

of species. In this case, the dim markings on the valve can not be confounded with any other, such as *Triceratium tripolaris* Temp. et Brun. and *Triceratium schlumbergeri* Temp. et Brun. However, this form and *Triceratium simplex* J. Brun are so closely allied with each other, that it is only too difficult to assign precise characters to each by a verbal description.

**Conclusion**

The species described here was found in the period from the Upper Miocene to the Lower Pliocene in the Neogene Tertiary of Japan. J. Brun and J. Tempère first described *Triceratium simplex* as Très rare, showing a characteristic figure in their works. The species in Japan reported in 1889 by them was found from Calcaire de Yedo. But they did not indicate its true locality in Yedo and the geological age of the bed where the species was found. If the several specimens mentioned above had not fallen into my hand, it would have remained a question whether such a triple-headed form ever belong to a diatom or not. But as Pl. 18 shows, these specimens can easily arrange themselves one after another according to their forms. The dim markings on its valve and the arrangement of the three lods in one plane show the form of *Triceratium simplex* J. Brun.

I can not find such a form in other papers already published in our country, and it is also true that the species is very rarely to be met with in other countries.

**References**


