

ARAUCARIA HAASTII ETTINGSHAUSEN FROM SHAG POINT, NEW ZEALAND

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ABSTRACT

An emended diagnosis, based on gross and cuticular features of *Araucaria haastii* Ettingshausen has been given here. It is found that the cuticle of *A. haastii* has a striking resemblance with *Araucaria klinkii* Lauterb.

INTRODUCTION

ARAUCARIA haastii was first described by Ettingshausen (1887) from Shag Point and Malvern Hills I, New Zealand. Its cuticular structure and affinity were not properly known then. Fresh collections from Shag Point were made in 1947 by Prof. O. H. Selling, Riksmuseets, Paleobotaniska Sektion, Stockholm. The collections included four specimens of *A. haastii*. Out of these four, two had well preserved cuticle. The present study is based on these specimens as well as a specimen (pl. 1, fig. 1) from the British Museum (Nat. Hist.), London.

DESCRIPTION

Araucaria haastii Ettingshausen

Pl. 1-3, figs. 1-4, Text-figs. 1, 2a-b, e

1887 *Araucaria haastii* Ettingshausen, p. 14, pl. 2, figs. 1-2.

1891 *Araucaria haastii* Ettingshausen, p. 255.

1919 *Araucarites haastii* (Ettingshausen) Seward, p. 269.

Emended diagnosis

Foliage shoot with closely set, spirally arranged, imbricate leaves, 2.5-7.5 cm. long and 1-1.8 cm. wide. Leaves ovate to lanceolate with a pointed apex. Lamina flat, its substance thick and keeled on lower side. Cuticle fairly thick, amphistomatic. Cells of upper and lower surfaces indistinguishable, showing rectangular to poly-

gonal cells. Lateral- and end-walls more or less straight, sometimes undulated. Surface-wall smooth. Stomata on both sides arranged longitudinally in numerous single files. Stomatal apparatus monocyclic. Guard cells slightly sunken, thinly cutinized, aperture slit-like or oval. Subsidiary cells 4 (2+2), rarely 5 or 6; lateral- and end-walls straight, thick; surface-wall unspecialized.

Lectotype — Specimen figured by Ettingshausen (1887, pl. 2, fig. 1).

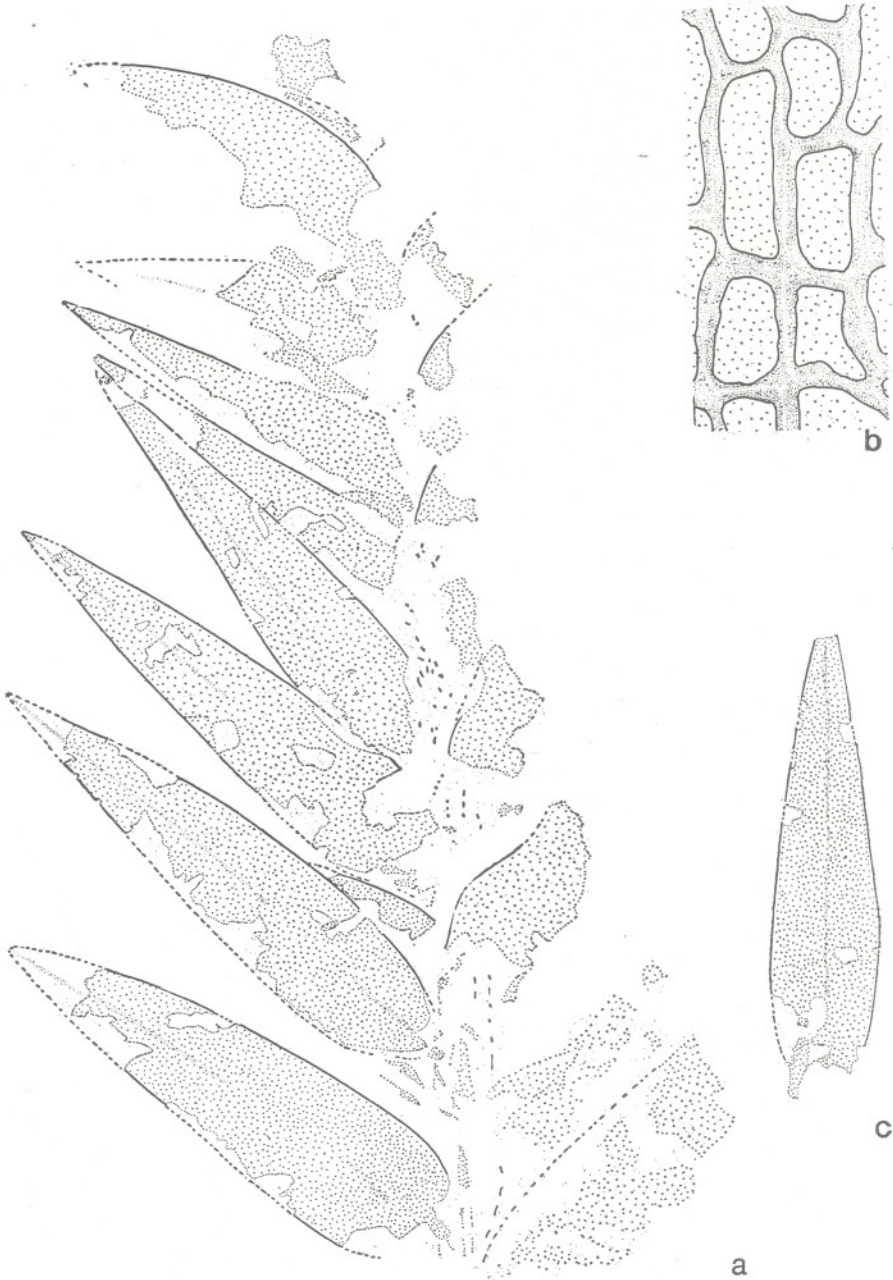
Locality — Shag Point, New Zealand.

Age — ?Upper Cretaceous.

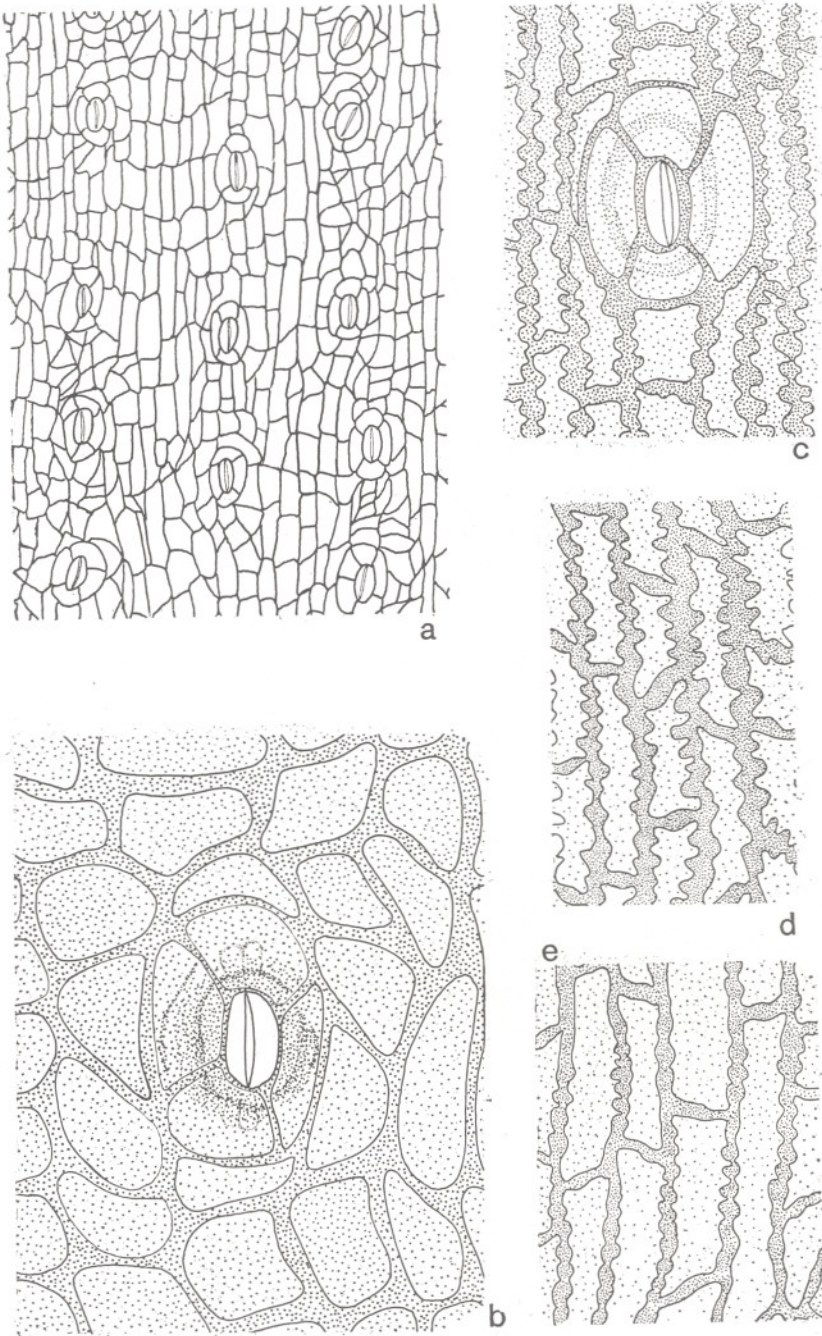
COMPARISON

From the Eocene of Seymour Island Dusén (1908) described *Araucaria imponens*. His description was based on a detached leaf slightly incomplete at tip. *A. haastii* is closest to *A. imponens* as far as shape, size and position of the keel are concerned. But *A. haastii* differs from *A. imponens* in having broader leaves. The present species also resembles to some extent, the leaves described as *Damarites carinata* by Hector (1886, 1870). The leaves in the latter case are slightly narrower and smaller in size. *A. nathorstii* Dusén (1899) from Punta Arenas is different from *A. haastii* as the former has much smaller leaves and they are not keeled, also in *A. haastii* the leaves are mostly firmly attached to the axis. From the Upper Cretaceous beds of Kaipara Harbour, New Zealand, Edwards (1926) recorded *Araucarites marshalli*. The leaves of *A. marshalli* are smaller than the fully developed leaves of *A. haastii* and unlike the latter, the tip of *A. marshalli* is subacute and it is not keeled.

Among the recent Araucarias, *A. haastii* comes closest to *A. klinkii* Lauterb. Externally they resemble in size and shape, both are keeled on the lower side and they have parallel longitudinal stripes very close to each other. In both, stomata are in



TEXT-FIG. 1 — *Araucaria haastii* Ettingshausen, a, no. 4/1964-1, $\times 1$, b, a few cells of lower cuticle, slide no. 4/1964-1A, $\times 200$; c, an isolated leaf, no. 4/1964-2, $\times 1$.



TEXT-FIG. 2— a, b, e, *Araucaria haastii* Ettingshausen; a, lower cuticle showing distribution and orientation of stomata, slide no. 4/1964-1A, $\times 50$; b, a stoma, slide no. 4/1964-2A, $\times 200$; e, a few cells of lower cuticle, slide no. 4/1964-1A, $\times 200$.
 c, d, *Araucaria klinkii* Lauterb; c, a stoma, slide no. A/1, $\times 200$; d, a few cells on lower side, slide no. A/1, $\times 200$.

numerous longitudinal rows and they are in single files, inside each file stomata orientated longitudinally and the subsidiary cells are 4-6 in number. Like *A. haastii* the epidermal cells of *A. klinkii* on the upper and lower sides are indistinguishable. In *A. klinkii*, unlike *A. haastii*, the epidermal cells have sinuous walls, whereas, in *A. haastii* the walls of the epidermal cells are only at places slightly undulated.

DISCUSSION

The diagnosis of *Araucaria haastii* is based on seven specimens, which include the two figured specimens of Ettingshausen (1887). A request was made to the authorities of the Geological Survey of New Zealand for the type specimen and a cuticular preparation from the same, but they were not available. However, while visiting their museum in 1947, Prof. O. H. Selling had the opportunity to examine the type specimen. Externally he found no difference between the type specimen and the specimens collected later. According to Ettingshausen the leaves had a thorny apex, but re-examination of his specimens did not show any such structure. His original description included a wood which he considered to be a part of the parent plant to which *A. haastii* belonged. Due to lack of any organic connection between the two, the diagnosis of the wood has not been considered here.

When Ettingshausen (1887) first described *A. haastii*, the genus *Araucaria* was known to have only two sections, i.e. sect. *Eutacta* and sect. *Columbea* Endlicher. But since then araucarias have been divided into four sections, namely sect. *Eutacta* Endlicher, sect. *Intermedia* White sect. *Bunya* Wilde and Eames and sect. *Columbea* Endlicher, Emend., Wilde and Eames (1952). The cuticle of *A. haastii*, as stated earlier, is similar to *A. klinkii* Lauterb., which was placed by White (1947) under the sect. *Intermedia* along with *A. hunsteinii* K. Schm. and *A. schumanniana* Warb. Therefore, at present, on the basis of cuticular structure *A. haastii* has provisionally been placed under the sect. *Intermedia*.

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EXPLANATION OF PLATE

PLATE 1

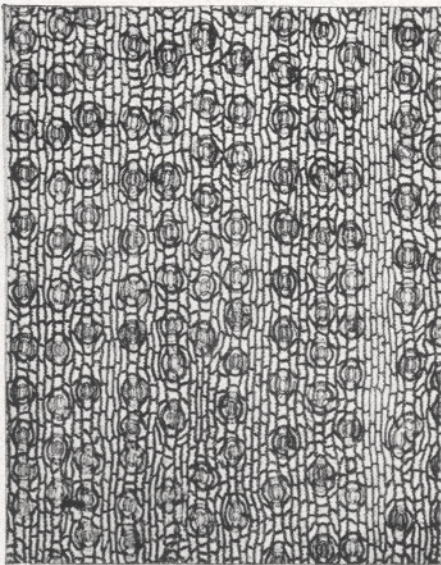
1. *A. haastii*, No. 4/1964-5 (this specimen belongs to the Br. Mus. (Nat. Hist.), London).
× 1.
2. *A. haastii*, showing stomatal distribution on lower side. Slide No. 4/1964-2A, × 50.
3. *Arucaria klinkii* Lauterb, lower cuticle showing stomatal distribution. Slide No. A/1, × 50.
4. *A. haastii*, a stoma enlarged. Slide No. 4/1964-2A, × 200.



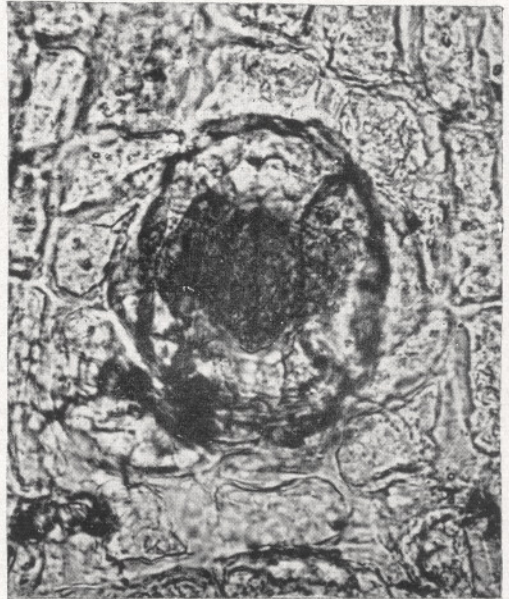
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2



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