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RECORDS.

1959/154

PLANT FOSSILS FROM THE BROOME SANDSTONE, WESTERN AUSTRALIA

by

Mary E. White

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Plant fossils were collected from four localities in Broome Sandstone in 1948 by D.J. Guppy, and from a locality in the Lighthouse cliffs at Broome by Dr. R.O. Brunnschweiler in 1949. Preliminary identification of the plants was made by Brunnschweiler and the following passage is extracted from his manuscript on the fossils of Dampier Land:-

"Among the plant remains the following forms are recognizable:

Bed B (top of cliff)

Ptilophyllum pecten (Lindley and Hutton)

Cladophlebis australis (Morris).

Otosamites cf. O. bengalensis (Oldham and Morris)

Pseudocycas sp.

Hausmannia sp.

? Cordaites (stem fragment)

Bed A (bottom of cliff)

Pterophyllum (Anomozamites) sp.

? Microphyllopteris sp.

Sphenopteris cf. S. superba Walkom.

? Dictyophyllum sp.

Cladophlebis cf. C. albertsi (Dunkel)

Taeniopteris cf. T. howardensis Walkom.

Nilssonia sp.

This collection was not damaged by the 1953 fire and is kept in Canberra under F.21503 - 21514."

The collection has now been re-examined. The following alterations have been made to Brunnschweiler's list:

"Pseudocycas sp." is determined as Zamites sp.

"Cordaites (stem fragment)" as Cycad Stem (Bucklandia)

"Microphyllopteris sp." as Dichopteris delicatula Seward.

"Pterophyllum (Anomozamites sp.)" as Nilssonia cf. N. schaumbergensis Dunk.

The age of the plant assemblage appears to be Late Jurassic or Early Cretaceous. Several of the species are characteristic Wealden species, but Otozamites bengalensis is not known from Cretaceous horizons in Australia and Walkom emphasises that the only Cretaceous occurrences of the genus Otozamites in Australia are very different from O. bengalensis. The re-classification of the Rajmahal Series in India, in which O.bengalensis occurs, as Lower Cretaceous (Arkell, 1956) suggests, however, that Cretaceous occurrences of the species in Australia are not unlikely.

Descriptions of Specimens:

I. Locality A3. 2 miles north of Goldwyer Well, 24 miles south of Broome; collected by D.J. Guppy, 1948:

Specimen F 21507. Contains a poorly preserved frond of Cladophlebis sp.

Specimen F 21508. Figure 1, Plate 1, shows a poorly preserved leaf which is referred tentatively to Taeniopteris howardensis Walk. The species is recorded by Walkom from the Burrum Series in Queensland.

Specimen F 21509. A sterile frond of Cladophlebis albertsi (Dunker) is present in this specimen.

Specimen F 21510. Figure 2, Plate 1 (magn. X2), shows portion of a fine fern frond. Preservation is not very good and no detail of venation is visible, but its appearance strongly suggests its identity with the Wealden frond Dichopteris delicatula Seward.

Specimen F 21512. Figure 3, Plate 1, shows a small section of a frond which is referred to Pterophyllum sp.

Specimen F 21513. Figure 4, Plate 1 (magn. X2), shows the terminal portion of a frond, poorly preserved, which is referred to Sphenopteris superba Shirley.

Specimen F 21514. Figure 5, Plate 1, shows a well preserved small Cycad frond with slight irregularity in sizes of the divisions of the lamina. Whether it should be referred to Pterophyllum (Anomozamites) on the basis of the irregular segmentation, or to Nilssonia is not clear. The attachment of the segments appears to be lateral, indicating Pterophyllum, but if this is an upper surface impression, the lower view could be different and the specimen referable to Nilssonia. The specimen resembles Nilssonia schaumbergensis Dunk. recorded by Walkom from the Burrum Series in Queensland, where it is associated with Taeniopteris howardensis as in this collection.

Specimen F 21516. Contains a single badly preserved frond of Ptilophyllum pecten L. & H.

Specimen F 21511. Figure 6, Plate 2 (Magn. X2), shows a poorly preserved frond of Dictyophyllum type similar in form to D. davidi Walk. which occurs in the Walloon Series in Queensland.

II. Locality CL 18. Cape Leveque; Collected by D.J. Guppy, 1948.

Specimen F 21517. Figure 7, Plate 2, shows part of a fertile frond of Cladophlebis albertsi (Dunk.). (Magn. X2). Each pinnule has two sori, one on either side of the midrib close to the rachis. The sori are raised and each appears to consist of a ring of nine sporangia.

Specimens F 21518. Casts of small indeterminate stems are present in these specimens.

III. Locality CL 31. Top of cliff section at Entrance Point, Roebuck Bay, Broome. Collected by D.J. Guppy, 1948.

Specimen F 21519. Figure 8, Plate 2, shows an impression of a frond of Otozamites bengalensis Oldham and Morris. No minute detail is visible in the rather coarse sandstone preservation. The genus Otozamites attains its widest geographical distribution in the Jurassic era but is fairly abundant both in Late Triassic and Lower Cretaceous. O. bengalensis is known only from the Jurassic in Australia and Walkom stresses that the only species of the genus occurring in Cretaceous strata in Australia are not at all similar to O. bengalensis.

IV. Locality CL 35. Top of section at Hill A, 15 mile north-west from Nillibubbaca Well, on Broome-Derby Road, 67 miles from Broome. Collected by D.J. Guppy, 1948.

Specimen F 16738. Contains a poorly preserved frond of Ptilophyllum pecten Lindley and Hutton.

V. Locality in Lighthouse Cliffs, Broome. Collected by Brunnschweiler, 1949.

Specimen F 21503. Figure 9, Plate 2, shows a frond of Ptilophyllum pecten Lindley and Hutton, associated with Cladophlebis australis (Morr.) (Frond fragment in horizontal position below Ptilophyllum frond). A small stem of Brachyphyllum mamillare L & H is also present in the specimen. Ptilophyllum pecten occurs in Jurassic and Cretaceous strata in Australia. Cladophlebis australis is very common in Jurassic strata but occurs as well in the Burrum and Styx River Series in Queensland.

Specimen F 21504. Figure 10, Plate 3, (magn. X2) shows a portion of a stem with prominent leaf bases. Brunnschweiler suggested Cordaitean affinity for this specimen, but it seems more likely it is a Cycadean stem. It is similar to the Bucklandia type of stem which often occurs associated with Ptilophyllum pecten type of fronds.

Specimen F 21505. Figure 11, Plate 3, shows a fragment of a small frond of Zamites type. Such fronds range from Rhaetic to Lower Cretaceous.

Specimen F 21506. Figure 12, Plate 3, (Magn. X2), shows portion of a leaf of a fern of the family Dipteridinae. This specimen is referable to the genus Hausmannia. The shape of the fragment suggests the orbicular form of the whole leaf. The venation of radiating veins which branch dichotomously, and fine veins at right angles to the main branches, is consistent with characteristics of Hausmannia. The species is similar to H. Buchii (Andrae) which has been recorded from the Walloon Series in Queensland and from Jurassic strata in Europe. There are similar Lower Cretaceous species in Europe and no positive species identification can be made in this instance.

Selected References

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PLATE I.

Figure 1. F21508.
Taeniopteris howardensis
Walkom. X2.

Figure 2. F21510.
Dichopteris delicatula
Seward. X2.

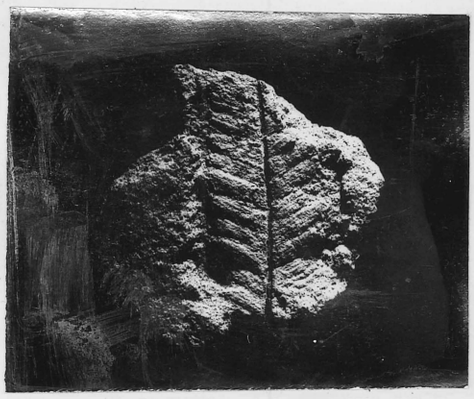

Figure 3. F21512.
Pterophyllum sp.?

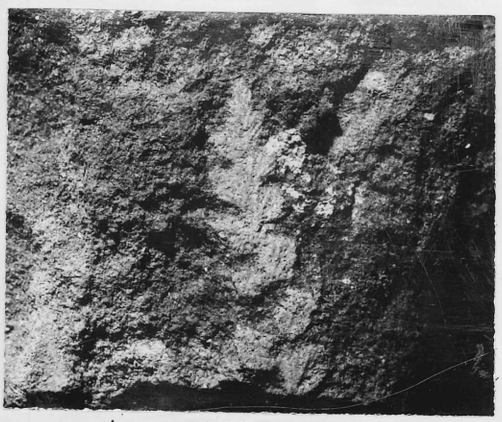

Figure 4. F21513.
Sphenopteris superba Shirley.
X2.

Figure 5. F21514. Nilssonia cf. N. Schaumbergensis
Dunk.

PLATE 2.

Figure 6. F21511. Dictyophyllum davidi Walkom. X2.

Figure 7. F21517. Fertile frond of Cladophlebis albertsi (Dunk) X2.

Figure 8. F21519. Otozamites bengalensis O. & M.

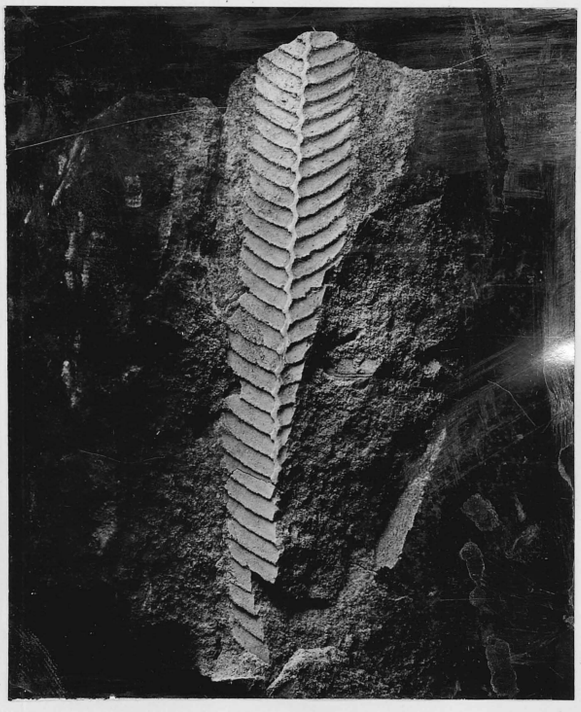

Figure 9. F21503. Ptilophyllum pecten L & H and Cladophlebis australis (Morr.).

PLATE 3.

Figure 10. F21504.
Bucklandia type of Cycad Stem
(magn. X2).

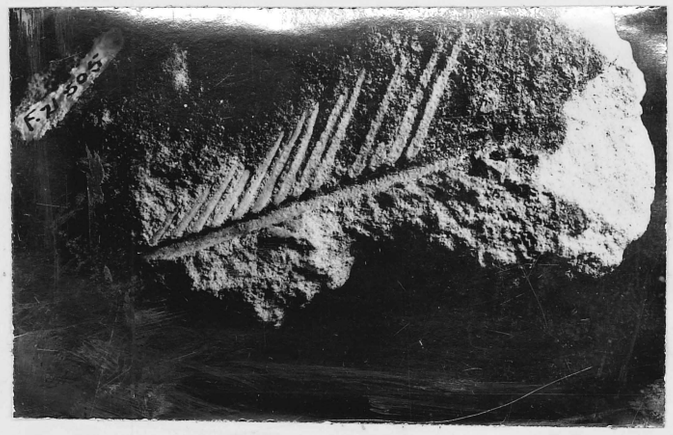

Figure 11. F21505.
Zamites sp.

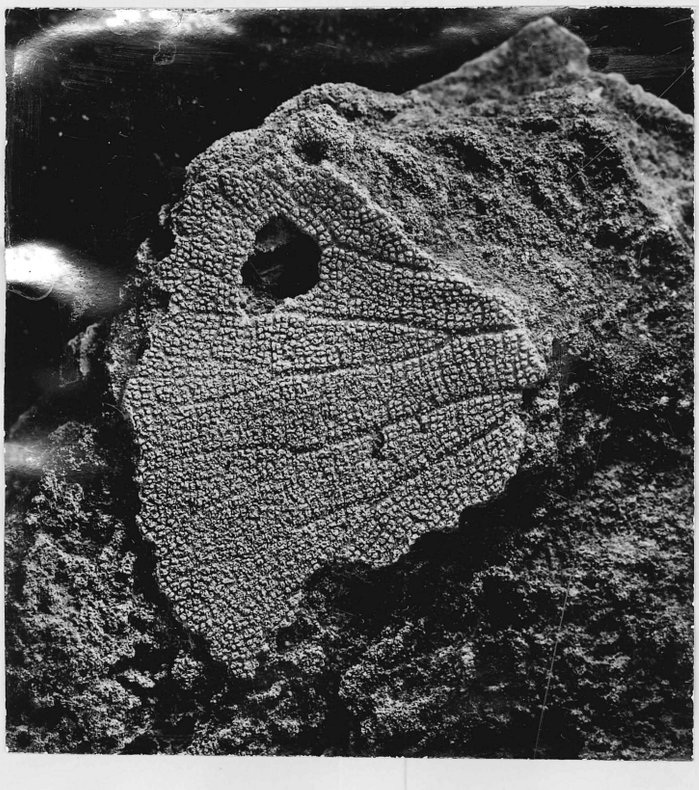

Figure 12. F21506.
Hausmannia buchii (Andrae) ?.
X2.