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FOSSIL ARTHROPODS OF CALIFORNIA.
No. 21. TERMITES FROM CALICO MOUNTAINS
NODULES.

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Drawings by author. Photos by George Brauer.

INTRODUCTION

This is the first of a series of papers that will be presented on the Miocene Lake bed nodules from the Calico Mountains, San Bernardino County, California.

In 1954 I first read newspaper clippings about the finding of fossil insects in lacustrine deposits in the Mojave Desert. On August 6, 1954, Allison R. Palmer and Allen M. Bassett published a brief note on Nonmarine Arthropods from California, in *Science*, vol. 120, pp. 228, 229. In May 1955 I had the privilege of seeing some of these interesting fossil insects in Dr. Palmer's office in Washington, D.C. His official report on these nodules and the contained insects is in press.

Early in 1956 Mr. and Mrs. John H. Rouse called on me to show some fossil insects in nodules they had found in the Calico Mountains. They were unaware of the earlier findings of Palmer and Bassett. Since then they have made frequent trips to collect nodules. These have also been collected in the Calico Mountains by entomologists from the University of California at Riverside, and by Mr. and Mrs. Sam Kirkby, also of Riverside.

I have made two trips to the area in the company of Los Angeles County Museum personnel and others. The first was on May 10 and 11, 1956, with George P. Kanakoff, Curator of Invertebrate Paleontology at the Museum, accompanied by Rostick Ryshkoff, Dara Shilo, Jeanne Hotchkiss, Mr. and Mrs. John G. Carr, and Mr. and Mrs. Rouse. On that trip we acquired for the Museum 4153 nodules from several sites in different canyons.

On April 12-14, 1957, our second party of 14 persons consisted of myself, George P. Kanakoff, and Rudolph Pesci of the Museum; Dr. Richard E. Loomis and Delmer Mangum of Long Beach State College; Mr. and Mrs. John G. Carr, Mr. and Mrs. Charles Artman, and Ralph Ackerman, and four students, Wilma Webster, Judy Clark, Sheryl Weber, and Elza Kops.

As a result of these trips and supplementary specimens received from Mrs. Rouse and Mrs. Kirkby, the Museum collection has reached a total of 10,266 specimens. These were collected at 38 sites in 109 separate lots, in 9 different quarter sections of the Yermo Quadrangle. Details of our findings will be published after the release of Dr. Palmer's report. Inasmuch as he is not reporting on termites, I am free to report on these at this time.

Only five Miocene termite species have been previously reported from the United States, and these are listed in the new list at the end of this article.

DESCRIPTIONS OF FOSSIL-BEARING NODULES

It is my pleasure to report the finding of ten nodules with termite wing impressions, all in Switchback Canyon in NE $\frac{1}{4}$ and NW $\frac{1}{4}$ of Section 19, Yermo Quadrangle, but at 5 different sites in the canyon, all at altitudes of 2700 to 3000 feet. The nodules are of entirely different types and formation, so that we can assume at least four different conditions of deposit.

The LACMIP sites are registered as Los Angeles County Museum Invertebrate Paleontology sites.

Site 10 (LACMIP 357) in NE $\frac{1}{4}$ Sect. 19, which we called the Rouse anticline, is located at the Switchback, upper level, altitude about 2700 feet. Here a great number of annual strata lie in a sharp anticline fold. Inasmuch as the annual varves are between 20 and 25 to the inch, and the deposit is over 10 feet thick, there is at least a 2400-year deposit of nodules. Nodule No. 1365, a yellow disc, containing Specimen 505, was found by Rostick Ryshkoff, May 10, 1956. It weighs 40.5 grams, and measures 48 x 34 x 19.5 mm., broken on one side, so that original size was probably 48 x 41 x 19.5 mm. It was formed of 7 or 8 layers and may

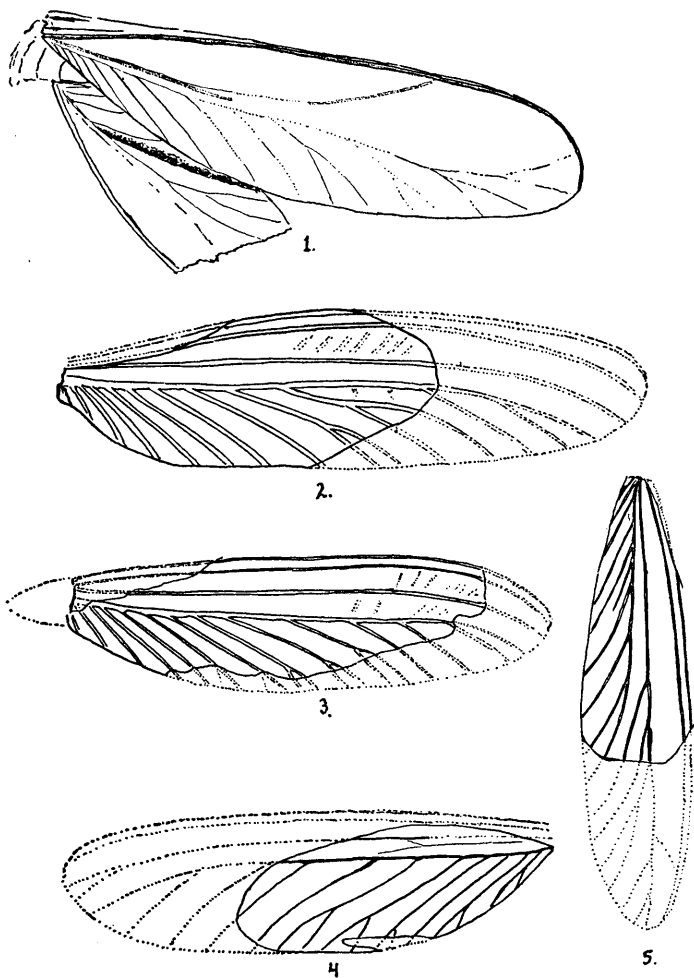


PLATE 5

1. Wing Pattern, *Cryptotermes ryshkoffi* n. sp., Specimen 505.
2. Wing Pattern, *Parastylotermes calico* n. sp., Specimen 553.
3. Wing pattern, *Reticulitermes laurae* n. sp. Specimen 912.
4. Wing pattern, *R. tibialis dubitans* n. sp., Specimen 376.
5. Wing pattern, *Gnathamitermes magnoculus rousei* n. sp., Specimen 362.

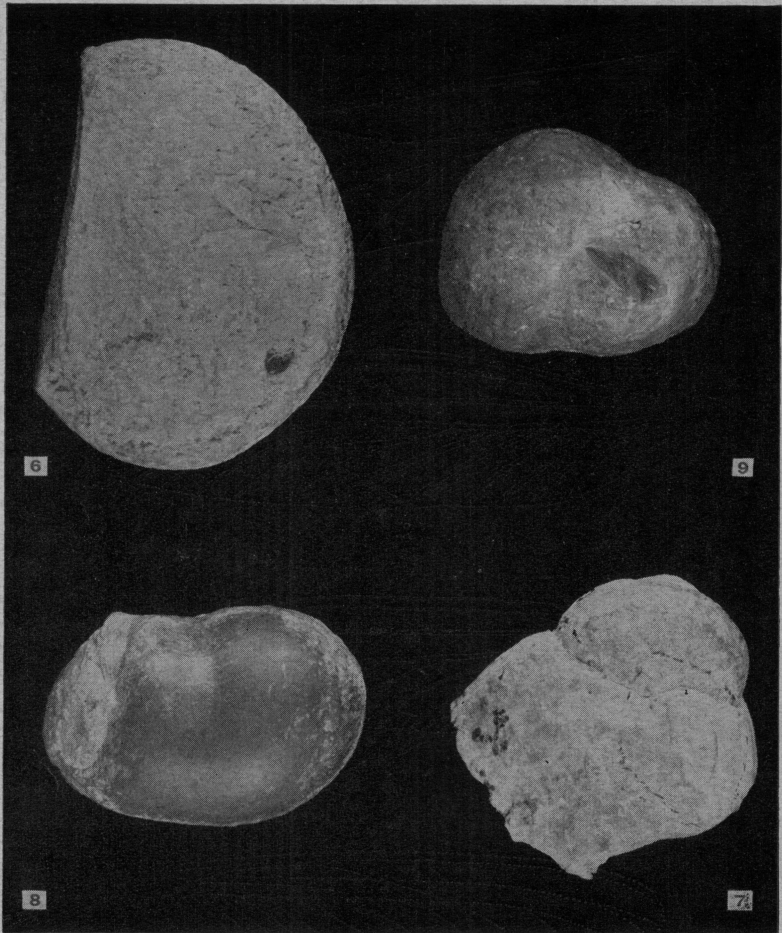


PLATE 6

6. Nodule 1365 showing specimen 505, *Cryptotermes ryshkoffi* n. sp.
7. Nodule 5485 showing specimen 553, *Parastylotermes calico* n. sp.
8. Nodule 4142 showing specimen 494, *Reticulitermes laurae* n. sp.
9. Nodule 4067 showing specimen 362, *Gnathamitermes magnoculus rousei* n. sp.

have been a rolling disc which settled in a water depression, and on which as the last coat was being added, in the final matrix, a termite body was included in the upper layer. (Figure 6).

Site 25 (LACMIP 373), also in NE $\frac{1}{4}$ Sect. 19, is an upward extension of the Rouse anticline, altitude 2725 feet. John Carr found (April 12, 1957) in the matrix, a small mottled gray and white mammillate nodule, No. 4802, with upper portion concave. On the under side is Specimen 547, part of which has been eroded. The complete nodule weighs 3.1 grams, and measures 20 x 19 x 9.5 mm.

Site 24 (LACMIP 372), just over in NW $\frac{1}{4}$ Sect. 19, is a large dump of white rock in the canyon bed, a very short distance up from the switchback, altitude about 2700 feet. Nodule 5485, found by Wilma Webster, April 12, 1957, is a broken specimen of a bi-mammillate nodule. It is quite complex in structure, with at least 5 years growth, and the Specimen 553 is inset on the upper surface. The fragment weighs 9.65 grams, and measures 24 x 22 x 19 mm. (Figure 7).

Site 16 (LACMIP, 363), farther up the canyon, in NW $\frac{1}{4}$ Sect. 19, is a borax mine dump, altitude about 2900 feet. Here Mrs. Rouse has found nodules 4066, 4067, 10265, and 10266.

Nodule 4066 is gray blue, layered, mound shape, bearing on its side Specimen 376. The nodule weighs 10.05 grams, and measures 26 x 23.5 x 15 mm.

Nodule 4067 is blue black, bearing on its upper side Specimen 362. The nodule weighs 6.9 grams, and measures 21.5 x 19 x 13 mm. (Figure 9).

Nodule 10265 is gray blue, of very complex nature. It has had several stages of growth, the first stages almost vertical to the last. In the vertical there are at least 8 annual growth layers, and in the last part about 6 annual growth layers. The Specimen 912 lies on the under side of this latest growth (Figure 10). The nodule weighs 49.4 grams, and measures 48.5 x 46.5 x 22.5 mm. On the upper side of the nodule there is also a petrified larva.

Nodule 10266 is also gray blue, mammillated, weighs 12.8 grams, and measures 30 x 22 x 18 mm. The Specimen 913 lies on the side of the nipple beneath. The growth lines are obscure.

At site 16B (LACMIP 364) nearby, Mrs. Rouse found a matrix deposit of horizontal strata, in which were imbedded nodules 4138, 4142, and 10264.

Nodule 4138 is many layered, yellow gray in color, and of inverted bee hive shape, weight 29 grams, measuring 33 x 30 x 27 mm. Specimen 496 was just under the outer ledge.

Nodule 4142 is blue black, shaped like a large bean, weighing 7.4 grams, measuring 25 x 16.5 x 13 mm. Specimen 494 is on a ledge near the end. (Figure 8)