

Distribution and Flights of Rare North American Desert

Termites of the Genus *Amitermes*¹

(Isoptera:Termitidae)

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These notes are presented as an interim report to stimulate a new interest in, and to further the search for, some of the rarer but nonetheless important termites in the southwestern United States. Considering man's increasing interest in termites from both the economic and scientific points of view, it is disturbing to realize that, of approximately 38 species in the continental United States, all the castes of two species have not yet been discovered. Only the worker and soldier castes are known for *Amitermes snyderi* Light, while only the alate is known for *Amitermes pallidus* Light.

Although *Amitermes* has a largely tropical distribution, eight species provide a characteristic element of the fauna in the semi-deserts and deserts of the American Southwest. They, and a few species in the closely related genus *Gnathamitermes*, form a group commonly known here as desert termites. The eight species have been described since the turn of the century, and seven, as we presently know them, by S. F. Light (1930a,b; 1932). Snyder (1949) presented detailed synonymies and further references. Except for the biological and ecological notes included with the original descriptions almost nothing has been published on them. Although at least two species, *Amitermes minimus* Light and *A. wheeleri* (Desneux), are of significant economic importance (Snyder, 1954), the challenging questions on their life histories, habits and ecology which Light (1930a, p. 173) asked about the American species still remain unanswered. The reasons for this continuing gap in our knowledge should be especially apparent to those who have attempted to collect or study them. Most of the species occupy very sparsely populated regions and, being cryptobiotic in the extreme, are thus rarely seen and even more rarely collected. As explained below, many of them have unorthodox flight seasons and periods which further limit their notice by man (Fig. 1).

The following distribution records, approximate elevations, and notes are intended as a guide for those who may be interested in contributing

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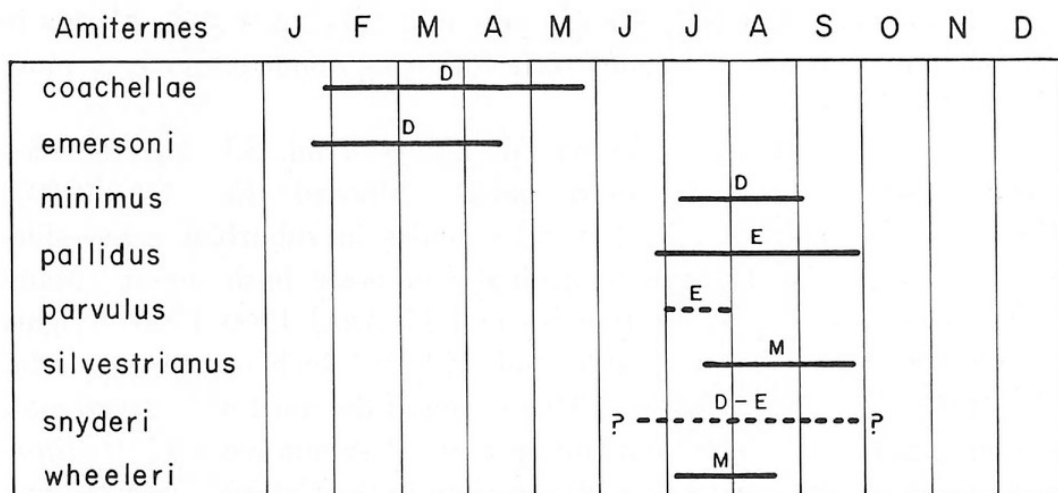


FIG. 1. Limits of the flight seasons of North American species of *Amitermes*, based mainly on records of the last ten years at Tucson, Arizona. Flights occur during the winter and summer rainy seasons. Although the alate of *A. snyderi* is unknown, its most probable flight season is suggested on the basis of negative evidence. See notes in text under this species. Flight periods occur as follows: D, day; E, evening twilight; M, morning twilight.

to the meager information on the group. Previous records have been taken from Light (1930a,b; 1931; 1932) and Snyder (1954). New records, mainly distributional limits in Arizona, are added from collections made by various members and friends of the Department of Entomology at the University of Arizona.

AMITERMES COACHELLAE Light. Previous records.—*California*: Riverside Co., upper end Coachella Valley, 1200–1800 ft. (Colorado Desert). Sandy desert and washes in dead roots and casual buried wood; build carton-lined tunnels and carton-like underground nest. *Nevada*: Clark Co., Boulder City, 2480 ft.; Las Vegas, 2030 ft. (Mojave Desert). At Boulder City, under stone in sandy wash. *Arizona*: Pima Co., suburban Tucson, 2400 ft. (Sonoran Desert); flight about noon, 20 February 1929.

New records.—*Arizona*: Yuma Co., Yuma, ca. 150 ft. (Sonoran Desert); flight during day, 2 March 1959. Pima Co., Tucson. Specimens collected from five flights, probably of this species, between 27 January and 25 May 1935–1968. Flights generally occurred on sunny days following 0.1 inch or more of rain, and at least two of them were concurrent with flights of *A. emersoni* Light.

AMITERMES EMERSONI Light. Previous records.—*California*: Riverside Co., Coachella Valley, 240 ft. below sea level–640 ft. (Colorado Desert). Varied situations in a winter corn patch, a fallow field, a ball park; in roots of dead Bermuda grass, small dead tree trunks, desert

willow mounds (*Chilopsis*), and in and along dry river bed. Flights in January and February on sunny days following about 0.1 inch or more of rain.

New records.—*Arizona*: Yuma Co., Yuma, 4 mi. S.E., 200 ft. (Sonoran Desert). In sandy desert under cardboard (Emerson, 1960). Pima Co., Tucson, 2400 ft. Several colonies in suburban area—sidewalks, yards, etc.—which was originally creosote bush desert. Many flights observed between 21 January and 17 April 1960–1968. Flights usually took place on sunny days following 0.1 inch or more of rain.

AMITERMES MINIMUS Light. This is one of the most widespread and, in some places, the most abundant species. Previous records.—*California*: Several southeastern localities, mainly in the Colorado and Mojave Deserts. *Nevada*: Clark Co., near Las Vegas. *Arizona*: Pima Co., Tucson. *Texas*: Bexar Co., San Antonio, 660 ft., flight on 12 July at 0815 hrs.; Cameron Co., Brownsville, 40 ft. In a variety of situations such as posts, poles, dead parts of shrubs, etc.; builds hard, crusty galleries over buried wood.

New records.—*Arizona*: Colonies have been found at several localities in the Tucson area (Pima Co.), north to 6 mi. W. Oracle, 3800 ft. (Pinal Co.) (Emerson, 1960); and south to 5.5 mi. W. Peña Blanca, 4400 ft. (Sta. Cruz Co.). In Tucson flights have been recorded between 7 July and 4 September 1962–1968. They have usually occurred on sunny mornings following fairly heavy showers.

AMITERMES PALLIDUS Light. A colony has not yet been reported. Previous records.—*Arizona*: Pima Co., Sabino Can., Sta. Catalina Mts., 2800 ft. (Sonoran Desert); numerous collections of alates taken at light, June–August.

New records.—*Arizona*: Pinal Co., Casa Grande, 1400 ft.; Pima Co., Tucson. As many as 14 flights have been recorded in one season, between 26 June and 30 September 1933–1968. They occur during evening twilight and are not always associated with rain. *Mexico*: 10 mi. S. Canipole, Baja California del Sur, in light trap, 28 August 1959; 10 mi. E. Navojoa, Sonora, at UV light, 13 August 1959 (both Sonoran Desert, low elevations).

AMITERMES PARVULUS Light. Previous records.—*Arizona*: Pima Co., Sabino Can., Sta. Catalina Mts., 2800 ft.; three alates taken at lights in July. *Texas*: Bexar Co., San Antonio, a nest containing alates, 8 October 1921.

New records.—Apparently none. Since this species has probably not been taken again in Arizona, the original specimens may warrant re-examination. It is possible that they have been confused with *A. pal-*

lidus, the only other *Amitermes* known to fly in the evening in Arizona.

AMITERMES SILVESTRIANUS Light. Previous records.—*California*: Riverside Co., upper end Coachella Valley, 240–720 ft. (Colorado Desert). Dry riverbed and washes, in dead wood on ground; build thick, encrusting galleries over buried wood. Flight at Palm Springs, before sunrise, 3 August two days after heavy rain.

New records.—*Arizona*: Yuma Co., near Yuma, 150 ft., colony under corrugated cardboard (Emerson, 1960). Pima Co., Tucson and vicinity. Several flights have been recorded between 17 July and 27 September 1961–1968. Flights always occurred within the hour before sunrise, on mornings following heavy showers.

AMITERMES SNYDERI Light. The winged form has never been reported. Previous records.—*California*: Apparently this species has been taken at only six localities between 1000–2000 ft., all in the Colorado and Mojave Deserts of southeastern California. It was found in miscellaneous buried wood and the roots of trees and shrubs.

New records.—*Arizona*: Yavapai Co., Rock Springs, 2000 ft., 12 July 1962, had built much carton work into a stump in a dry wash. Pima Co., Tucson, 2500 ft., March 1961, working manure buried for new lawn. Molino Basin, Sta. Catalina Mts., 4400 ft., March, August and October 1961, all under large, deeply set stones. Brown Can., Baboquivari Mts., 4050 ft., 4 August 1961; under buried wood. (All Sonoran Desert.)

It is puzzling why no alate has yet been found as even a possible match for the very large soldiers of this species. There are apparently not even any likely candidates, for practically all of the *Amitermes* flying in southern Arizona can be assigned to described species. Considering the size of the soldiers, the alate might be expected to be larger than any of the other southwestern species. It is therefore suggested that the alate of *A. snyderi* may be flying concurrently with some large, common termitid, such as *Gnathamitermes perplexus* (Banks), and is thus passing completely unnoticed. Collections from flights, supposedly of *Gnathamitermes*, should be carefully checked to see whether this might be the case. These flights occur during or after summer rainstorms, either in the daytime or early evening.

AMITERMES WHEELERI (Desneux). Previous records.—This species has the widest distribution known to date, from Los Angeles Co., California, south to Colima, Colima, Mexico, and east to Brownsville, Texas. It is rather commonly found in cow chips, stumps, dead trees and desert plants, as well as in posts, poles and the woodwork of buildings.

New records.—*Arizona*: Many colonies have been found on the

desert and in mountain canyons of the southeastern part of the state between 1600 and 5600 ft. Flight records in this area extend from 3 July to 21 August 1956–1968. All of the well-documented flights are known to have occurred within the hour before sunrise on mornings following heavy showers. Many of them have been concurrent with flights of *A. silvestrianus*. Specimens from flights of this species which have been reported for other times of day should probably be re-examined. *Mexico*: Among several other records, the following collections of colonies show that this species is widely distributed over the central plateau: 49.5 mi. N.N.W. Gomez-Palacio, 3800 ft., Durango; 32.4 mi. N. Aguascalientes, 6500 ft., Aguascalientes; 32.8 mi. N.E. San Luis Potosí, 5250 ft., S.L.P.; and Ajijic, 5100 ft., Jalisco.

DISCUSSION

It should be obvious from the slow accumulation of new records and their fortuitous distribution that every opportunity should be taken to obtain members of this genus with complete biological information accompanying each collection. Much more work needs to be done in Mexico, since present evidence, particularly on the distribution of *A. pallidus* and *A. wheeleri*, suggests that most, if not all, of the others will likely be found over many of the desert areas in the northwestern part of that country. The most valuable records will be those made during the flight season when workers, soldiers and winged forms may be found together in the colonies.

Identification of soldiers and especially of alates is difficult unless one is familiar with termites and has a reference collection available for comparisons. Most of the species are small, they are best handled in alcohol, and careful measurements must be used in conjunction with other characters. A well-illustrated, regional revision should simplify this task considerably. Toward this end it should be noted that approximately 200 collections of *Amitermes* are available for study in the insect collection of the Department of Entomology at the University of Arizona. The author is willing to act as a temporary agent for receiving further collections until such a task is undertaken. The time of flight should prove extremely useful as a specific behavioral characteristic and, with this in mind, a series of studies is planned, relating flight activities of each species to seasonal meteorological conditions.

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BOOK REVIEW

ECOLOGY OF APHIDOPHAGOUS INSECTS. Edited by Ivo Hodek and M. L. Dutkova. 1966. Dr. W. Junk Publishers, The Hague, The Netherlands. 360 p. + 10 plates. Approximately \$14.00.

The book presents the proceedings of a symposium held in Liblice (near Prague), Czechoslovakia from September 27 to October 1, 1965. The editor states "In 1964, at the International Congress of Entomology, it was pointed out that large Congresses fulfill other aims and that research workers engaged in studying natural enemies of aphids, for example, should meet in smaller groups to discuss their results and hypotheses." The symposium was initiated to fulfill this need. Specialists from 18 countries presented 74 papers during the course of the five day symposium.

The book is divided onto 6 sections corresponding to those of the Symposium: I, Food Ecology of Aphidophagous Insects; II, Voltinism and Arrest of Development in Aphidophagous Insects; III, Behavior of Aphidophagous Insects and of Aphids; IV, Distribution of Aphidophagous Insects in Habitats; V, Population Dynamics of Aphids and Their Natural Enemies; VI, Aphidophagous Insects in Biological and Integrated Control. The opening paper in each section is a review of earlier published material or as in sections III and IV, an introductory paper. The last paper of each section presents a summary and general discussion of the preceding papers to compensate for the subjective approach of individual authors. The papers of the symposium have been condensed, overlapping sections deleted, and data often summarized into tables and graphs in order that a concise manual could be published. The editor reports that the personal views of the authors have not been altered even if controversial or conflicting, but they receive comments in the closing discussion paper of each section. Most of the papers deal with aphid predators, especially coccinellids, and to a lesser extent with syrphids and chrysopids. There are areas where the coverage is rather scarce (i.e. hemipterous predators), however, the editor points out that this is solely a reflection of the activity of research workers attending the symposium. It is also brought out that knowledge of voltinism and of Neuroptera is lacking. There are occasional sentences whereby phrasing or wordiness may cause the reader to falter, but these present no difficulty in interpretation.



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