

Commonwealth of Australia, Commonwealth
Scientific and Industrial Research Organization.

**ENTOMOLOGICAL SURVEY OF THE COOK
ISLANDS AND NIUE**

1—HYMENOPTERA-FORMICIDAE

By

R. W. TAYLOR

Division of Entomology, CSIRO, Canberra

*Reprinted from the NEW ZEALAND JOURNAL OF SCIENCE, Vol. 10, No. 4
December 1967*

ENTOMOLOGICAL SURVEY OF THE COOK ISLANDS AND NIUE

1—HYMENOPTERA-FORMICIDAE*

By R. W. TAYLOR,
Division of Entomology, CSIRO, Canberra

(Received for publication, 16 August 1967)

Summary

Three ant species are added to the 17 previously recorded from the Polynesian Cook Islands, and the first records of ants (19 species) from Niue are given. These constitute typical synthetic oceanic faunulae assembled largely, if not entirely, from propagules introduced by man.

In a recent survey of the Polynesian ants Wilson and Taylor (1967a, 1967b) concluded that, prior to the arrival of man, few if any native Indo-Australian species ranged into Polynesia east of Rotuma, Samoa and Tonga. No certain endemics have been collected from the archipelagoes of the central and eastern Pacific, but many of the islands are known to support rich synthetic faunas made up of species certainly or probably carried to them by man. Analysis of species-number/island-area relationships suggests that species densities have stabilised on many of these islands. Certain dominant species show mosaic, but complementary, distribution patterns among the islands, and these have probably been effected through their mutual competitive exclusion. Historical records of individual island faunulae reveal several cases of apparent competitive replacement among these species. Thus, while faunal densities may have stabilised, their specific composition is subject to change.

Wilson and Taylor were unable to locate records of ants from Niue and listed only 17 species from the Cook Islands. These included the following (with the years of collection given in brackets): from Rarotonga: *Anochetus graeffei* Mayr [1937]; *Pheidole fervens* F. Smith [1925, 1937]; *P. megacephala* (F.) [1914]; *P. oceanica* Mayr [1925]; *Cardiocondyla nuda* Mayr [1925]; *Solenopsis geminata* (F.) [1924, 1925, 1937]; *Monomorium destructor* (Jerdon) [1925]; *M. floricola* (Jerdon) [1925]; *Tetramorium pacificum* Mayr [1927; 1929]; *T. simillimum* (F. Smith) [1937];

*The collections reviewed here are deposited in Entomology Division, D.S.I.R., Nelson, and were generously loaned for this study by Drs G. W. Ramsay and A. C. Eyles of that institution.

Tapinoma melanocephalum (F.) [no date]; *Technomyrmex albipes* (F. Smith) [1914, 1929]; *Anoplolepis longipes* (Jerdon) [1937]; *Paratrechina longicornis* (Latreille) [1925]; *P. vaga* (Forel) [1937]; from Aitutaki: *Tetramorium guineense* (F.) [1955]; and *Iridomyrmex anceps* (Roger) [1955].

Recent collections made during brief visits to the islands by the New Zealand entomologists G. W. Ramsay and A. C. Eyles add nine species to this list, and provide the first records of ants from Niue and from seven additional Cook Islands. These records are summarised in Table 1. Specific ecological details are not available, and the faunal tallies for most islands are probably not complete. Details of general distribution and ecology for most of the species listed are included in Wilson and Taylor (1967b) and are not repeated here. The Melanesian species *Tetramorium wilsoni* Mann 1921* is recorded here for the first time from Polynesia. It was taken on Niue by Eyles in sweep-net samples, at Fitimatoga (17 Sept., 1964), Hikutavake and Talava (29 Sept., 1964).

In Table 1 the species are separated into two classes. *Group A* includes "tramp" or "vagrant" species certainly distributed by recent human commerce. All of these are widespread in Polynesia and occur also in either the African or American tropics (frequently in both), and most of them apparently originated in one of these two areas. They were almost certainly introduced by man on to the Cook Islands and Niue. *Group B* includes species ranging from the Indo-Australian area into Polynesia. Some of these may be native in extreme south-western Polynesia, but most are not continuously distributed beyond Samoa and Tonga, and have probably been carried further east into the Pacific by man. *Tetramorium wilsoni* and *Iridomyrmex anceps* are notable, since, unlike the other Group B species, neither is known from Samoa or Tonga. *T. wilsoni* has been recorded only from the Fiji Islands (but note that *T. melanogyna* Mann, 1919, of the Solomon Islands, might be the same species). *I. anceps* is essentially continuously distributed from India to eastern Australia, through Micronesia and most of Melanesia, at least to the Solomons. It has been collected once on Viti Levu, Fiji (near Nadi airport in 1956). In these two cases, at least, recent dispersal by commerce seems certain.

In short, the known ants of the Cook Islands and Niue constitute typical synthetic oceanic faunulae, originating largely, if not entirely, from propagules introduced by man.

*New Combination for *Tetramorium pacificum* Mayr var. *wilsoni* Mann, 1921, Bull. Mus. Comp. Zool., Harvard, 64 (5): 640, worker. Original localities: FIJI ISLANDS: *Viti Levu*: Nausori (type locality), Waiyanitu. *Vanua Levu*: Lasema, Suene. *Kadavu*: Vanua Ava. (This determination has been verified by comparison of a Niue specimen with the *wilsoni* type, by Dr E. O. Wilson of Harvard University.) The specific status of *wilsoni* is confirmed by its sympatric association with *pacificum* on Niue.

TABLE 1—Known Inter-island Distribution of Ants in the Cook Islands and Niue. + Current record; 0 earlier record; > both current and earlier records. For further explanation see text.

| | Class | Niue | Palmerston | Aitutaki | Rarotonga | Manuae | Te-Au-o-Tu | Atiu | Mangaia | Mitiaro | Mauke |
|---|-------|------|------------|----------|-----------|--------|------------|------|---------|---------|-------|
| <i>Anochetus graeffei</i> Mayr | B | | | | 0 | | | | | | |
| <i>Pheidole fervens</i> F. Sm. | B | | + | + | > | | | + | | | |
| <i>Pheidole megacephala</i> (F.) | A | + | | + | 0 | | | + | + | + | + |
| <i>Pheidole oceanica</i> Mayr | B | + | | | 0 | | | | | + | |
| <i>Pheidole umbonata</i> Mayr | B | + | | | | | | | | | |
| <i>Pheidole sexspinosa</i> Mayr | B | + | | | | | | | | | |
| <i>Cardiocondyla emeryi</i> Forel | A | + | + | + | + | + | | + | | + | |
| <i>Cardiocondyla nuda</i> (Mayr) | A | + | | | 0 | | | | | + | |
| <i>Solenopsis geminata</i> (F.) | A | | | | > | | | + | | | |
| <i>Monomorium destructor</i> (Jerd.) | A | | | | 0 | | | | | | |
| <i>Monomorium floricola</i> (Jerd.) | A | + | | | 0 | | | | | | |
| <i>Triglyphothrix striatidens</i> (Emery) | A | | | | 0 | | | | | | |
| <i>Tetramorium guineense</i> (F.) | A | | | > | | + | | + | | + | |
| <i>Tetramorium pacificum</i> Mayr | B | + | | | 0 | | | | | | |
| <i>Tetramorium simillimum</i> (F. Sm.) | A | + | + | | 0 | | | | | | |
| <i>Tetramorium tonganum</i> Mayr | B | + | | | | | | | | | |
| <i>Tetramorium wilsoni</i> Mann | B | + | | | | | | | | | |
| <i>Iridomyrmex anceps</i> Roger | B | | + | 0 | | + | + | | | | |
| <i>Tapinoma melanocephalum</i> (F.) | A | + | | | 0 | + | + | | | + | |
| <i>Tapinoma minutum</i> Mayr | B | + | | | | | | | | | |
| <i>Technomymex albipes</i> (F. Sm.) | B | + | | | 0 | | | | | + | |
| <i>Anoplolepis longipes</i> (Jerd.) | A | + | | + | 0 | + | | + | | + | |
| <i>Plagirolepis alluaudi</i> Emery | A | + | + | | | | | | | | |
| <i>Paratrechina longicornis</i> (Latr.) | A | + | | | 0 | | + | | | + | |
| <i>Paratrechina vaga</i> Forel | A | + | + | + | > | | | + | + | + | + |
| <i>Camponotus chloroticus</i> Emery | B | + | | | | | | | | | |

The contemporaneous presence of *Pheidole fervens* with *P. megacephala* on Aitutaki and Atiu, and of *megacephala* with *P. oceanica* on Niue and Mitiaro is notable, since these species show inter-island complementarity of distribution elsewhere in Polynesia. "*P. fervens* . . . is unknown from Samoa at the present time but is a dominant ant in the Society Islands. *P. megacephala* . . . has the reverse distribution: it is dominant on Upolu (Samoa) but is rare or absent in the Society Islands. *P. oceanica* . . . replaces *megacephala* on Savai'i (Samoa) and occurs on Upolu only on the western side facing Savai'i; it is furthermore relatively uncommon in the Society Islands. Elsewhere in Polynesia the complementarity among the three species is maintained. *Fervens* occurs on Tonga and Pitcairn; it is occasional in the Marquesas and unknown from Hawaii. *Megacephala* is absent from Tonga and Pitcairn but is dominant on the Marquesas and Hawaii." (Wilson & Taylor, 1967b.) Future collectors should take careful note of these species; since one will probably assume

dominance on each island, possibly with extinction of the others. The Rarotongan *Pheidole* are worth special attention, since all three species have been recorded in the past, but *P. fervens* alone is present in the recent collections.

REFERENCES

- WILSON, E. O.; TAYLOR, R. W. 1967a: An Estimate of the Potential Evolutionary Increase of Species Density in the Polynesian Ant Fauna. *Evolution* 21: 1-10.
— 1967b: The Ants of Polynesia. *Pacif. Insects Monogr.*, 14: 1-109.