

PSEUDOMYRMEX APACHE, A NEW SPECIES FROM
THE SOUTHWESTERN UNITED STATES
(HYMENOPTERA: FORMICIDAE)¹

By WILLIAM S. CREIGHTON

Department of Biology, College of the City of New York

The majority of the material on which this paper is based was secured during 1951 and 1952. At that time the writer was engaged in a field survey of the ants of the border region. This work was made possible by a fellowship from the John Simon Guggenheim Memorial Foundation. My sincere thanks go to the Foundation for the support which made this work possible.

The taxonomy of the genus *Pseudomyrmex* presents an unusual number of difficulties. Even the generic name has not escaped the hazard of uncertainty. The name *Pseudomyrma*, which has been accepted for more than a century, has recently been challenged. Twice in the past two years Dr. M. R. Smith has introduced prior names for the genus. The latest choice is *Pseudomyrmex* Lund which, on the basis of data presented by Dr. Smith in 1952 (Proc. Ent. Soc. Wash., Vol. 54, No. 2, p. 97) has a priority of thirteen years over *Pseudomyrma* Guérin. But any difficulty with the generic name is a minor matter in contrast to the deplorable incertitude which marks a large number of the species in this genus. The taxonomy of many of them is in such confusion that specific recognition is largely a matter of guess-work. With this fact in mind, the writer has hesitated for some time to describe the material treated here. It would seem, however, that we can no longer avoid dealing with this material for, whatever its taxonomic status may be, it is certain that its presence in the southwestern United States has not previously been recognized. It is probable that the older records for this ant have been attributed to *Ps. pallida*. The two insects are superficially

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similar and they occur in the same stations in the southwest. As long as it was believed that only *pallida* occurred in this area, there was little reason to suspect the existence of a second species.

The writer first encountered *Ps. apache* in 1932. In September of that year a single, deälated female was taken in Ramsey Canyon in the Huachuca Mountains of Arizona. This insect had a clear, yellow color similar to that of *Ps. pallida*, but it differed from the female of *pallida* in its much greater size and in a number of other structural features. Since no workers were associated with the above female, its status was problematical and it was not included in my 1950 monograph on North American ants. In the spring of 1949, after that paper had gone to press, Dr. L. F. Byars sent me a number of workers of a large, yellow *Pseudomyrmex* which had come from three colonies taken in southern Arizona. These seemed to be the same species as the female from Ramsey Canyon, but this was not verified until the following summer. In 1950 a colony containing all three castes was taken by the writer in Garden Canyon in the Huachuca Mountains. Since that time the writer has secured forty-five additional colonies of this ant in fifteen different stations. These stations extend from the Brownsville area of Texas to the mountains of southern California. It is clear that this ant is abundant in the southwestern United States and some cognizance must be taken of it. The difficulty is to decide how this insect should be treated.

The writer first believed that this ant represented *Ps. decipiens* or a northern race of it. Dr. W. M. Wheeler had identified as *decipiens* a series of specimens taken in Costa Rica. These specimens were similar to those coming from the southwestern United States but there were several differences, particularly in the shape of the petiole. In 1949, when the above comparison was made, there was not enough material to evaluate these differences. As a result the writer told Dr. Byars that the insect probably represented some form of *decipiens*, but that no certain statement could be made until more data was available. In the meantime the writer attempted to discover how Dr. Wheeler had identi-

fied the Costa Rica specimens. As far as could be ascertained there are no types of *decipiens* in American collections. Nor do there seem to be any specimens other than types which Forel might have determined. Apparently Dr. Wheeler used Forel's description as the basis for his identification and, as will be shown, this is a bad business at best. The original description of *decipiens* appeared in the ant section of the *Biologia Centrali-Americana*. It was based upon specimens coming from Teapa, a small town in the state of Tabasco, Mexico. The description is brief, but this is not the worst than can be said for it. It is sufficiently explicit to show that it does not accord in several important respects with the figure which is supposed to accompany it. These differences are so marked that there is justification for the view that the description and the figure can scarcely have been drawn from the same insect. In the figure the size of the eyes, the length of the antennal scapes and the proportions of the petiolar joints do not correspond at all to the description. Forel did not prepare the figure but he undoubtedly wrote the description, hence the latter seems more reliable as an indication of the characteristics of *decipiens*. Wheeler had evidently reached this conclusion, for his Costa Rica specimens agree much better with Forel's description than with his figure. But it should be clear that there can be no certainty as to the exact nature of Forel's *decipiens* until the types can be re-examined.

At the same time it seemed to the writer that it should be possible to clarify the status of specimens coming from the southwestern United States by collecting in northern Mexico. If the southwestern specimens were a northern race of *decipiens*, the two should intergrade at some point between Tabasco and the southern border of the United States. The survey work mentioned above gave an ideal opportunity to test this in the field. During January and February of 1952 careful vertical surveys were made in the mountains of eastern Mexico at three latitudes. The southernmost of these was in the Tamazunchale area. This survey ranged from three hundred feet to eight thousand feet. Similar studies were made in the mountains west of

Linares (1800-6200 feet) and in those south and west of Monterrey (2000-7200 feet). By this time it was apparent that *Ps. apache* prefers to nest in old live oak limbs. Many hundred limbs of live oaks were examined in the areas mentioned above. While three different species of *Pseudomyrmex* were encountered in these limbs, none of them showed the slightest relation to *apache*. The coastal plain was less thoroughly studied, but collections made in the area between Mante and Tampico showed no trace of *apache*. The only abundant *Pseudomyrmex* in that area is a particularly vicious, light brown species which lives in the thorns of the bull-horn Acacia. In northwestern Mexico the situation is essentially similar. *Ps. apache* is abundant in the mountains at the northern end of the main chain of the Sierra Madre Occidental. But the writer failed to find it in several lesser ranges in northern Sonora. It may be added that in some of these ranges the conditions seemed ideal for this ant and the writer felt certain that it would be found. Negative evidence of this sort does not prove the absence of *Ps. apache* in the areas mentioned above, but it does prove that the insect is less abundant in these areas than in stations further north. This would not be true if this ant were a northern fringe of some southern species, for in that case its incidence should increase to the south. But, since all available evidence points to the fact that the area of greatest abundance for this ant lies in southern Arizona and that its incidence decreases to the south, it is safe to conclude that the insect is not a northern race of *decipiens* but a separate species.

Since all three castes have been figured on the plate which accompanies this article, the descriptive material which follows is largely limited to details of sculpture and pilosity that could not be shown in the figures.

***Pseudomyrmex apache* sp. nov.**
Plate 12

Female: head (mandibles excluded) 1.35 mm.; thorax 2.2 mm.; overall length 7-8 mm.

Upper surface of the head covered with small, shallow, circular punctures. These punctures close set from the anterior margin of the head to the level of the median ocel-

lus. From that level to the occipital border the punctures are much more widely spaced with the surface between them delicately coriaceous or reticulate and very feebly shining. The punctures on the genae and gula are notably smaller and more widely spaced than those on the front of the head. Both genae and gula are feebly shining. Clypeus and frontal lobes without distinct punctures and rather strongly shining. Mandibles with coarse, oval, piligerous punctures, the surface between them finely shagreened. Antennal scapes with numerous fine punctures, their surface more shining than the front of the head but less shining than the frontal lobes. Punctures on the thorax smaller, more shallow and more widely spaced than those on the front of the head, the surface between the punctures with a very delicate, reticulate sculpture. Pronotum and epinotum feebly shining. Scutum, scutellum, mesothoracic sternite and episternite a little more strongly shining. Punctures on the petiole very sparse and fine. Postpetiole and gaster with only a few, scattered, piligerous punctures. The delicate coriaceous sculpture becomes feeblower as one passes from the petiole to the gaster and the parts become progressively more shining, with the gastric segments particularly so. Fore femora laterally compressed. Middle and hind femora not laterally compressed. Both femora and tibiae with numerous, very small punctures which do not dull the shining surface.

Erect hairs rather sparse over most of the body. Mandibles and antennal scapes with moderately numerous, short, erect hairs. Those on the upper surface of the head and on the gula much sparser, widely separated and very irregular in length. Dorsum of the pronotum with six or eight erect hairs. Scutum and scutellum with about a dozen erect hairs of varying lengths. Epinotum without erect hairs. Petiole and postpetiole with eight or ten erect hairs each. These hairs are often, but not always, confined to the posterior half of each node. Erect gastric hairs largely confined to a broad band at the rear edge of each segment. Legs virtually devoid of erect hairs, except for one or two on the fore coxae and the fore femora. Tarsal joints and antennal funiculi densely covered with fine, semi-erect hairs

which grade into pubescence. Pubescence elsewhere very fine and so sparse that it is not usually noticeable except under considerable magnification or in very oblique light.

Color: clear, golden yellow, the inner border of the mandibles blackish brown. Edges of the thoracic sclerites and gastric segments a slightly deeper brownish yellow than the rest of the surface. Wings slightly iridescent, faintly tinged with yellow, the veins a deeper yellow, the stigma brown.

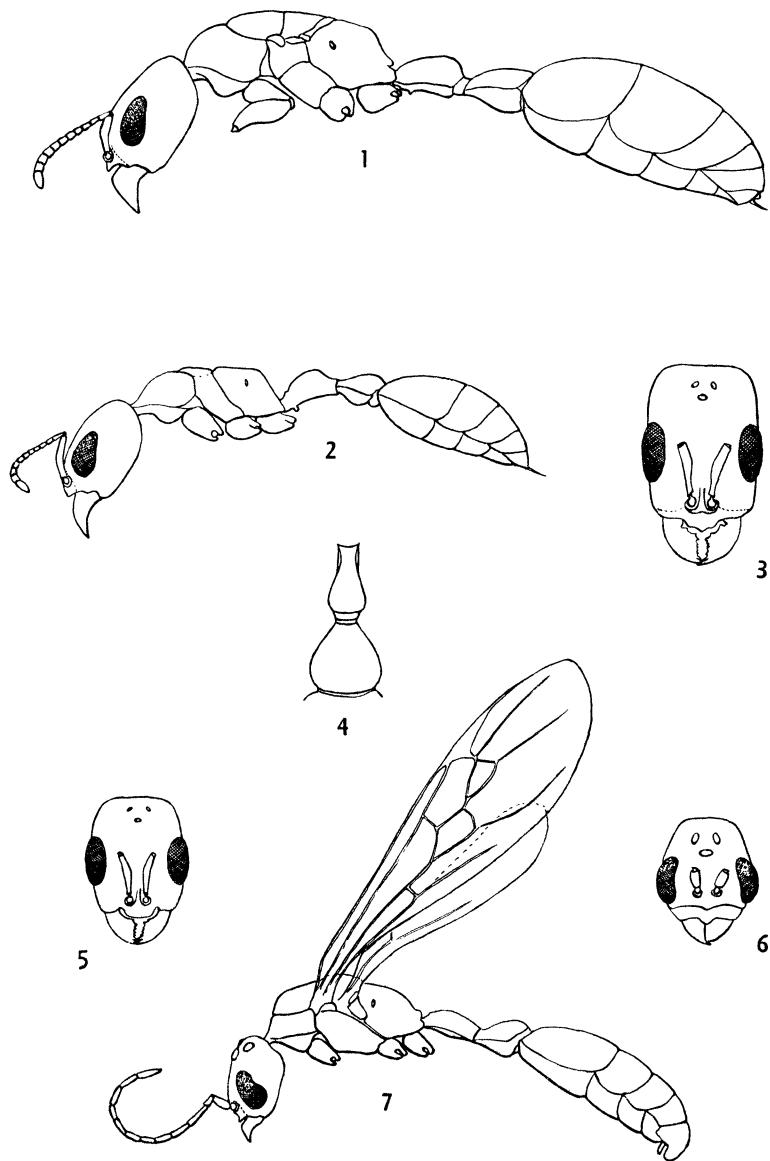
Male: head (mandibles excluded) 1.0 mm.; thorax 2.0 mm.; overall length 6.5-7.0 mm.

Upper surface of the head finely coriaceous and feebly shining except for the area between the median ocellus and the antennal insertions, where the coriaceous sculpture is largely replaced by fine punctures. Mandibles a little more heavily sculptured and less shining than the rest of the head. Antennae finely and densely granulose, opaque. Lateral portions of the pronotum feebly coriaceous, less shining than the median portion which is covered with rather coarse, scattered punctures. Scutum and scutellum heavily coriaceous and dull except for an irregular, shining band down the middle of each. This band is coarsely punctate and very feebly coriaceous. Epinotum feebly coriaceous and rather strongly shining above, more heavily coriaceous and punctate on the sides. Mesothoracic sternite strongly shining and coarsely punctate, the episternite feebly coriaceous and strongly shining. Petiolar nodes feebly shining and weakly coriaceous. The gaster very feebly sculptured and much more shining than the petiolar nodes.

Erect hairs present on the ocellar area of the head, the scutum and the scutellum. Dorsum of the epinotum, the petiolar nodes and the dorsum of the anterior gastric segments with one or two erect hairs each at most, often hairless. Dorsum of the terminal gastric segment with several erect hairs. There are numerous erect hairs, which form

EXPLANATION OF PLATE 12

Pseudomyrmex apache sp. nov. Fig. 1. Female, profile view. Fig. 2. Worker, profile view. Fig. 3. Head of female. Fig. 4. Petiole and post-petiole of worker, from above. Fig. 5. Head of worker. Fig. 6. Head of male. Fig. 7. Male, profile view.

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a distinct fringe, at the ventral edge of each gastric segment. Eyes with a number of short and extremely fine erect hairs. Mandibles with numerous, coarse, erect or semi-erect hairs. Pubescence abundant and fully appressed on the rear half of the head, semierect on the anterior half and on the gula. Pubescence on the thorax and the petiolar nodes much more dilute than on the head. Pubescence extremely dilute on the dorsum of the gaster but more abundant on its sides and ventral surface. Antennae and tarsi with abundant, short, appressed or semierect hairs which grade into pubescence. Femora and tibiae with less abundant pubescence than the tarsi.

Color: thorax, gaster, legs and antennae dirty yellowish brown. The scutum and the head a darker, more piceous brown. Mandibles dingy yellow. Wings pale, yellowish brown, the veins and stigma darker.

Worker: head (mandibles excluded) 1.15 mm.; thorax 1.5 mm.; overall length 5-6 mm.

Upper surface of the head covered with circular punctures, as in the female, but with the coriaceous sculpture between the punctures much less pronounced, particularly on the rear half of the head. This gives the surface a slightly more shining appearance than in the female. Mandibles much smoother than those of the female, the piligerous punctures notably smaller and, for the most part, circular or nearly so. Punctures on the thoracic dorsum obscured by the even, coriaceous sculpture. This sculpture is also present on the sides of the thorax. Both dorsum and sides of the thorax feebly shining. Sculpture of the petiolar nodes and the gaster the same as in the female. Fore femora much less laterally compressed than in the female, not greatly different in shape from the middle and hind femora. The fine, coriaceous sculpture on the appendages more distinct than in the female, often obscuring the punctures, hence the legs are less shining than in the female.

Pilosity on the head very similar to that of the female. Erect hairs on the thoracic dorsum, when present, sparse and confined to the pronotum and mesonotum. A few erect hairs are present on the petiole, the postpetiole and the dorsum of each gastric segment, especially the last. Pubes-

scence fine and obscure, very dilute on the head, more abundant on the thorax, petiolar nodes and gaster, but nowhere conspicuous.

Color: uniform, clear, golden yellow. In some specimens the posterior gastric segment is slightly infuscated.

Types of female, male and worker deposited in the collection of the Museum of Comparative Zoology, Cambridge, Mass.; the type locality is Brown Canyon (4400'), Baboquivari Mts., Arizona. Type nest taken on Sept. 2, 1951, in *Quercus oblongifolia*.

Because of its clear, yellow color and dilute pubescence *apache* is not likely to be confused with any of our other species except *pallida*. There is little likelihood of confusion between these two species if all castes are present, for *apache* is larger than *pallida* and this difference is particularly striking in the sexual forms. Workers from young nests of *apache* are, however, sometimes no larger than those of *pallida*. In such cases recognition depends upon other criteria which will separate the two species regardless of size. Thus the worker of *apache* is more heavily sculptured than that of *pallida*, particularly on the upper surface of the head. In *apache* the cephalic punctures and the delicate, coriaceous sculpture between them can be readily seen, even under medium magnification, and the surface of the head is feebly shining. In *pallida* the cephalic sculpture is notably finer. The punctures are scarcely distinguishable from the sculpture between them, even under high magnification, and the surface of the head is moderately shining. The head of *apache* is broader in proportion to its length, with the sides more convex than is the case with *pallida*. The greatest length of the eye in *apache* is slightly less than one half the distance from the insertion of the mandible to the occipital margin. In *pallida* the greatest length of the eye is slightly more than one half the above distance. The petiolar node of *apache*, seen in profile has a broadly rounded crest, from which both the anterior and the posterior face slope away at about the same angle. Thus the outline of the node appears as a flattened and slightly lopsided arc. In *pallida* the rear face of the node of the petiole descends much more abruptly

than the front face, hence, in profile the node presents a wedge-shaped rather than an arcuate outline.

The distributional records for *apache* are presented below. Unless otherwise noted all specimens were taken by the writer. The elevations of the majority of these records were checked with topographic sheets and an altimeter, the remainder with one or the other.

ARIZONA:

Huachuca Mountains: Ramsey Canyon (5500') single deälated female; Garden Canyon (5800') three colonies in *Quercus emoryi*; Carr Canyon (5400') two colonies in *Q. emoryi*.

Santa Rita Mountains: Madera Canyon (5900') one colony in *Q. emoryi*; Sweetwater (5800') three colonies in *Q. emoryi*.

Dragoon Mountains: Cochise Stronghold (5200') one colony in *Q. emoryi*.

Chiricahua Mountains: Chiricahua National Monument (5400') one colony in *Q. emoryi*.

Peloncillo Mountains: Cottonwood Canyon (4800') two colonies in *Q. emoryi*.

Baboquivari Mountains: Baboquivari Canyon (3500') one colony in *Q. oblongifolia*; Brown Canyon (4200-4400') type locality, nine colonies in *Q. emoryi* or *Q. oblongifolia*.

Ajo Mountains: (Organpipe Cactus National Monument) Alamo Canyon (2200-2800') ten colonies, eight in *Prosopis juliflora*, two in *Q. turbinella*.

Growler Mountains: (Organpipe Cactus National Monument) La Abra Wash (1300') two colonies in *Prosopis juliflora*.

Canelo Hills: Canelo Pass (5300') one colony in *Q. emoryi*.

Pena Blanca Springs (3900') Santa Cruz Co. Coll. L. F. Byars, one colony without data on nest site.

San Miguel (2400') Pima Co. Coll. L. F. Byars, one colony in *Prosopis juliflora*.

Organpipe Cactus National Monument Headquarters (1650') Coll. E. R. Tinkham, one colony, said to have been taken emerging from a rodent's burrow!

CHIHUAHUA:

Sierra de en Medio: Nogales Ranch (5000') five colonies in *Q. emoryi* or *Q. oblongifolia*.

TEXAS:

Fowlerton (300') La Salle Co., one colony in *Prosopis juliflora*; Monte Alto (60'), Hidalgo Co., two colonies in *P. juliflora*.

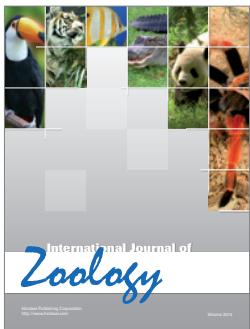
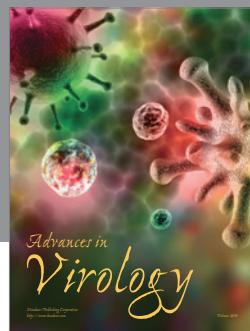
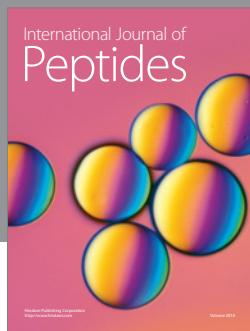
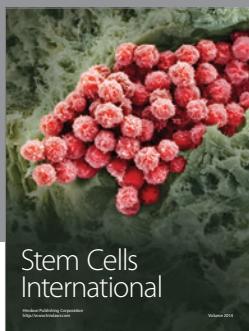
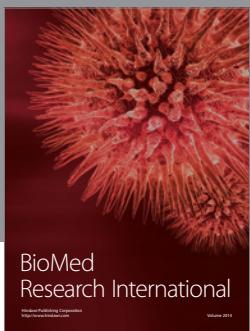
CALIFORNIA:

Agua Tibia Mountains: Dripping Springs (1500') two colonies in *Q. chrysolepis*.

The records cited above show that *Ps. apache* occurs most frequently in mountainous areas at elevations between 2500 and 6000 feet. In such stations it ordinarily nests in evergreen oaks but, when the range descends below the oak belt, it will nest in mesquite. Whether the ants nest in oak or mesquite they select a good-sized branch or the trunk of the tree as a nest site. They seldom nest in twigs and this response is striking in view of the fact that twigs are a favorite nest site for our eastern species. The branches selected by *apache* are those through which wood-boring insects have driven passages. The ants carefully clean these passages of the detritus left by the insects which made them. In most cases the passages have a diameter several times as great as that of the ants, hence it would seem that the ants could be jarred out of the open ends of the passages without difficulty. This is not the case, for they cling to the walls with great tenacity. To get all the specimens out of a nest it is usually necessary to split the branch into small pieces so that all the passages are exposed. *Ps. apache* is not at all pugnacious. It will bite on occasion but it very rarely stings and the sting is not painful. Since many species of *Pseudomyrmex*, some much smaller than *apache*, sting severely on the slightest provocation, this behavior is rather surprising.

The female of *apache* often becomes physogastric after the colony is well established. The intersegmental membranes do not bulge but are stretched tight between the separated gastric sclerites. Since the latter retain their curvature, the gaster of a physogastric female of *apache* looks like a white tube running through a series of close-

fitting, golden rings. In this species brood is usually present during the entire year. In some nests this is also true of the sexual forms. Fully mature males and winged females have been taken from nests as early as March 20th and as late as November 3rd. In southern Arizona and northern Chihuahua most nests are free from sexual forms by the first of October. It seems clear, however, that the sexual forms occasionally remain in the nest over the winter. Four colonies containing mature males and females were taken in the Ajo Mountains of Arizona on March 20th and 21st, 1952. Four days before snow had fallen in this area and the winter had been an unusually cool one. If the males and females in the above nests came from early spring brood it was certainly a remarkable performance. It is more reasonable to suppose that they had overwintered in the nest. It appears that there is no mass egress of males and females in the marriage flight of this species. The writer had it under daily observation during September in 1951. Although there were many males and females in the nests during that period no marriage flight was seen. But during the month of September a number of deälated, nest-founding females were taken. Since these had not been encountered earlier, the presumption is that some sort of marriage flight was taking place during September. If this had been of the usual type it is hard to see how it could have been overlooked. It seems probable that the marriage flight of *apache* extends over much of the month of September, with the males and virgin females leaving the nest in comparatively small numbers at intervals during that period.



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