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Teleutomyrmex kutteri, spec. nov. A new species from Sierra Nevada (Granada, Spain)

(Hymenoptera, Formicidae)

By Alberto Tinaut

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This paper describes a new species for the genus *Teleutomyrmex*, based on the size of its hairs on the epinotum and petiole and the male genital structure. This species is dedicated to the esteemed myrmecologist, Dr. H. Kutter.

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Introduction

The genus *Teleutomyrmex* Kutter, 1950 constitutes one of the most outstanding examples of adaptation to social parasitism, especially in two aspects: the disappearance of the worker's caste and its morphological adaptation and simplification. Its biology has been extensively studied by Kutter (1950) and Stumper (1951) and cited in general works such as those of Wilson (1971), Dumpert (1981) and Passera (1984), and for this reason we will not discuss this point.

Another interesting aspect of this genus is its scarcity, a common phenomenon among parasitic species (Baroni-Urbani 1967); however, in this case it is more remarkable, given that since its discovery in 1949 by Kutter, on the outskirts of Saas-Fee (Swiss Alps), this genus has only been found a few times, in chronological order: in 1950 by Stumper also in Saas-Fee (Stumper 1951), in 1955 by Collingwood in Briançon (French Alps) (Collingwood 1956), and finally, in 1985 and 1987 by Buschinger on the outskirts of Briançon and in the French Pyrenees.

All of these specimens pertain to the single species known until this present article, namely *T. schneideri* Kutter, 1950. In the Iberian Peninsula, it has only been found by us and only on one occasion, on 26. 7. 1982, on the northern slope of the Sierra Nevada. Since this date, it has been searched for, but without success.

We have compared our material with samples from Saas-Fee, Briançon and the Pyrenees and we observed that there exists a sufficient difference to consider specimens from the Sierra Nevada as a different species which we have the pleasure and satisfaction of dedicating to Dr. H. Kutter.

Material

Of *T. schneideri* Kutter we examined the following individuals: 1 ♀ Briançon (1. 6. 1955) Collingwood leg. (Col. Collingwood); 1 ♀ Briançon (13. 8. 1984) Buschinger leg. (Col. Buschinger); 2 ♀ ♀ Saas-Fee (7. 1949) Kutter leg. (Col. Kutter); 2 ♂ ♂ Saas-Fee (7. 1949) Kutter leg. (Col. Kutter); 2 ♀ ♀ Saas-Fee (7. 1949) Kutter leg. (Col. Museum Lausanne); 1 ♂ Saas-Fee (7. 1949) Kutter leg. (Col. Museum Lausanne); 1 ♂, 2 ♀ ♀ Pyrenees (28. 7. 1986) Buschinger leg.

Of *T. kutteri*, spec. nov. the examined material constitutes forty-two females and three males, coming from the same ants' nest on two consecutive days. Since most of them were collected on 26. 7. 1982, this is the date that we will use for all specimens. The following year the ants' nest had disappeared, perhaps from natural causes, considering that we barely disturbed it. We only collected specimens that appeared under the stone which covered the above-mentioned ants' nest.

Teleutomyrmex kutteri, spec. nov.

Holotype: ♀ "Prados de Otero", 2.250 m., 26. 7. 1982, (Sierra Nevada, Spain) deposited in our collection. Paratypes: 41 ♀♀, 3 ♂♂ (genital structure n° 200 and 206) from the same nest as holotype and deposited in our collection, and those of Dr. Kutter, Dr. A. Buschinger and in the Zoologische Staatssammlung (München).

Description of female

General colour dark brown. Legs, mandibles, and antennae all yellowish as well as the edges and the gastric segments. Hyaline wings with lightly marked veins, having only one cubital cell. Two types of hairs: filiforme ones, distributed on head, antennae and legs (Phot. 1 b); and the other ones, with the apex like a brush located on thorax, petiole and post-petiole (Phot. 2 d), as described by Kutter for *T. schneideri*.

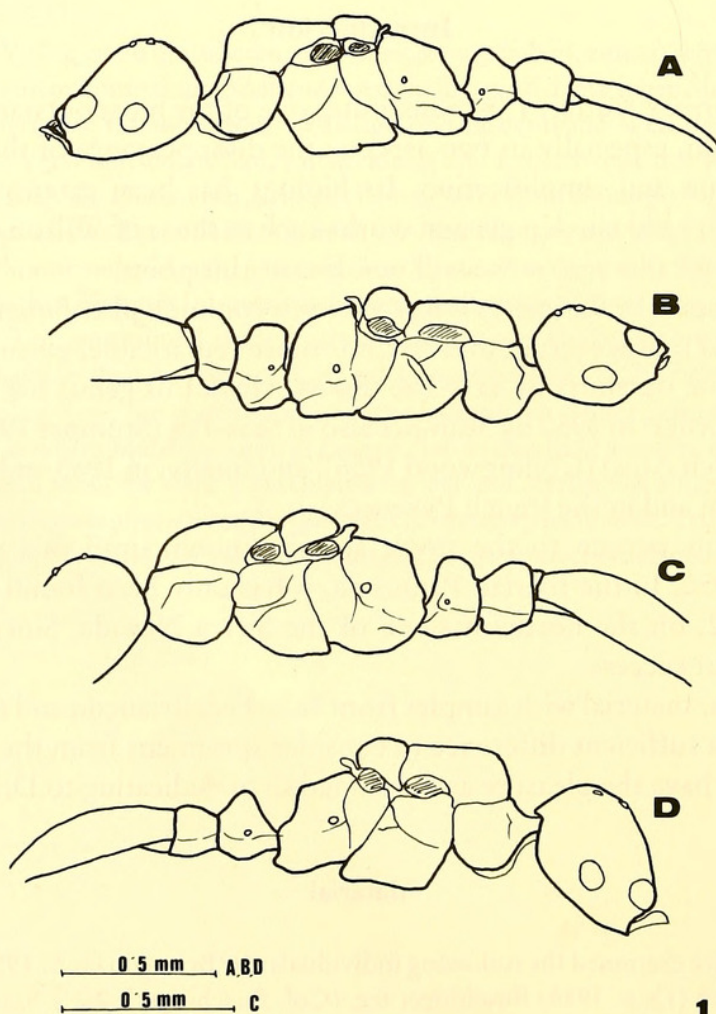


Fig. 1. A., B. Lateral view of the female and male of *T. kutteri*. C., D. lateral view of the male and female of *T. schneideri* from Saas-Fee. (Hairs not drawn).

Head rectangular, with occipital margin slightly concave, lateral edges rather convex and clypeal margin a little concave and almost as wide as the occipital one. Mandibles atrophied and oval-shaped, forming a point at the end. Antennae with the scape slightly exceeding the occipital border, funiculus of nine segments in which the second one is slightly longer than the first one and twice as long as the third. The last three articles form a small club (Fig. 2).

Clypeus rounded and yellowish, which makes it stand out against the rest of the head. No frontal arists. Small compound eyes located in middle of each side. Ocelli relatively well developed: the lateral ones rise a little above the cephalic area which is completely polished and shining, with scattered and

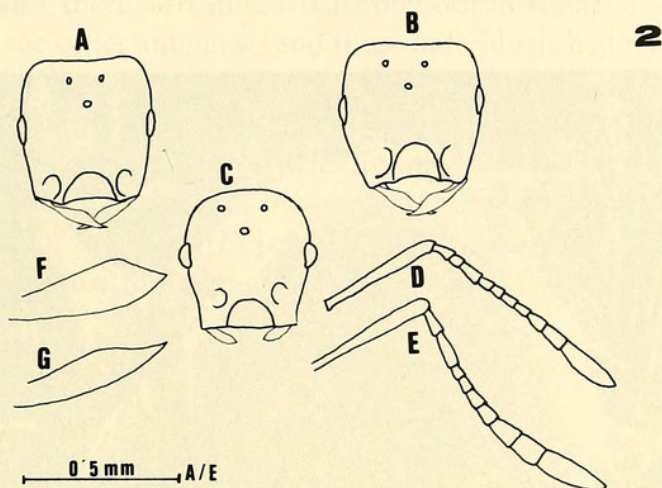


Fig. 2. A. Head of the female of *T. kutteri*; B. Head of the female of *T. schneideri*; C. head of the male of *T. kutteri*; D., E. Antennae of the females of *T. schneideri* and *T. kutteri*, respectively; F., G. mandibles of the males of *T. kutteri* and *T. schneideri*, respectively. (All the specimens of *T. schneideri* from Saas-Fee).

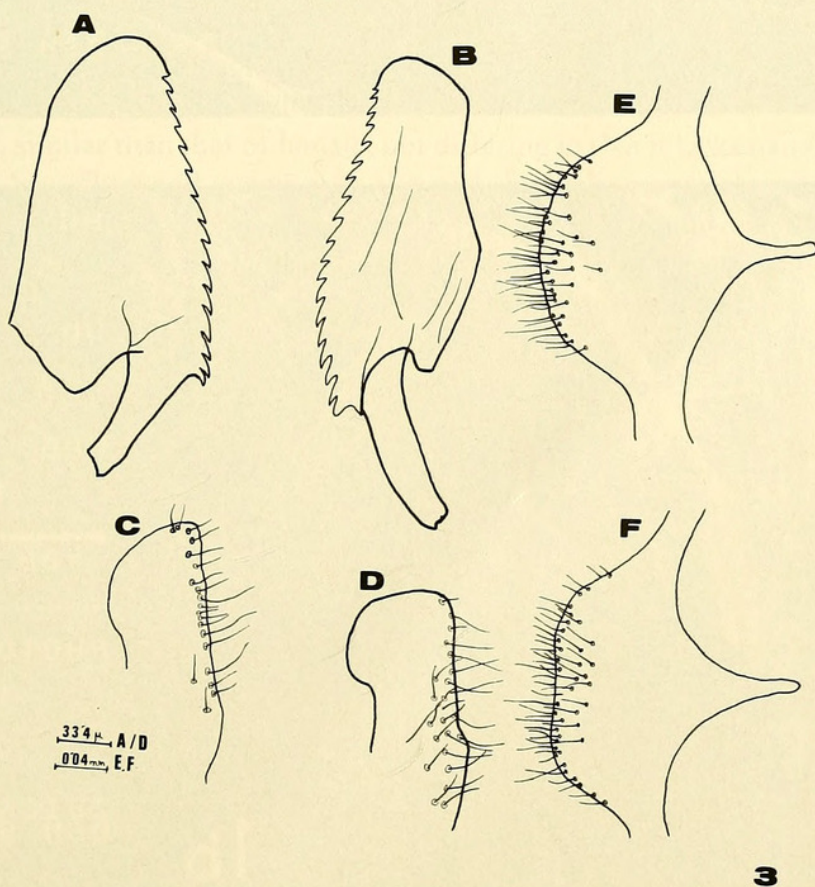


Fig. 3. Sagitta, volsella and subgenital plate of *T. kutteri* (B., D., E.) and *T. schneideri* (A., C., F.) from Saas-Fee.

decumbent hairs, suberect on mandibles and erect as well as suberect on the whole antennal surface, where there are numerous hairs (Phot. 1 b).

Complete thorax with a rectangular profile (Fig. 1 a). Pronotum reduced in size, with small lateral angles between which the head rests. Scutum with the anterior margin forming a right angle. Microalveolate surface both on dorsal and lateral regions; hairs in abundance. Small trapezoidal scutellum, with surface similar to that of scutum. Metanotum very small. Epinotum with dorsal surface and the sloping face forming an obtuse angle, with two small arists appearing on the vertex which correspond to the remains of epinotal teeth. Microalveolar sculpture much more pronounced than that of pronotum, but, hairs slightly smaller (Phot. 2 b, d).

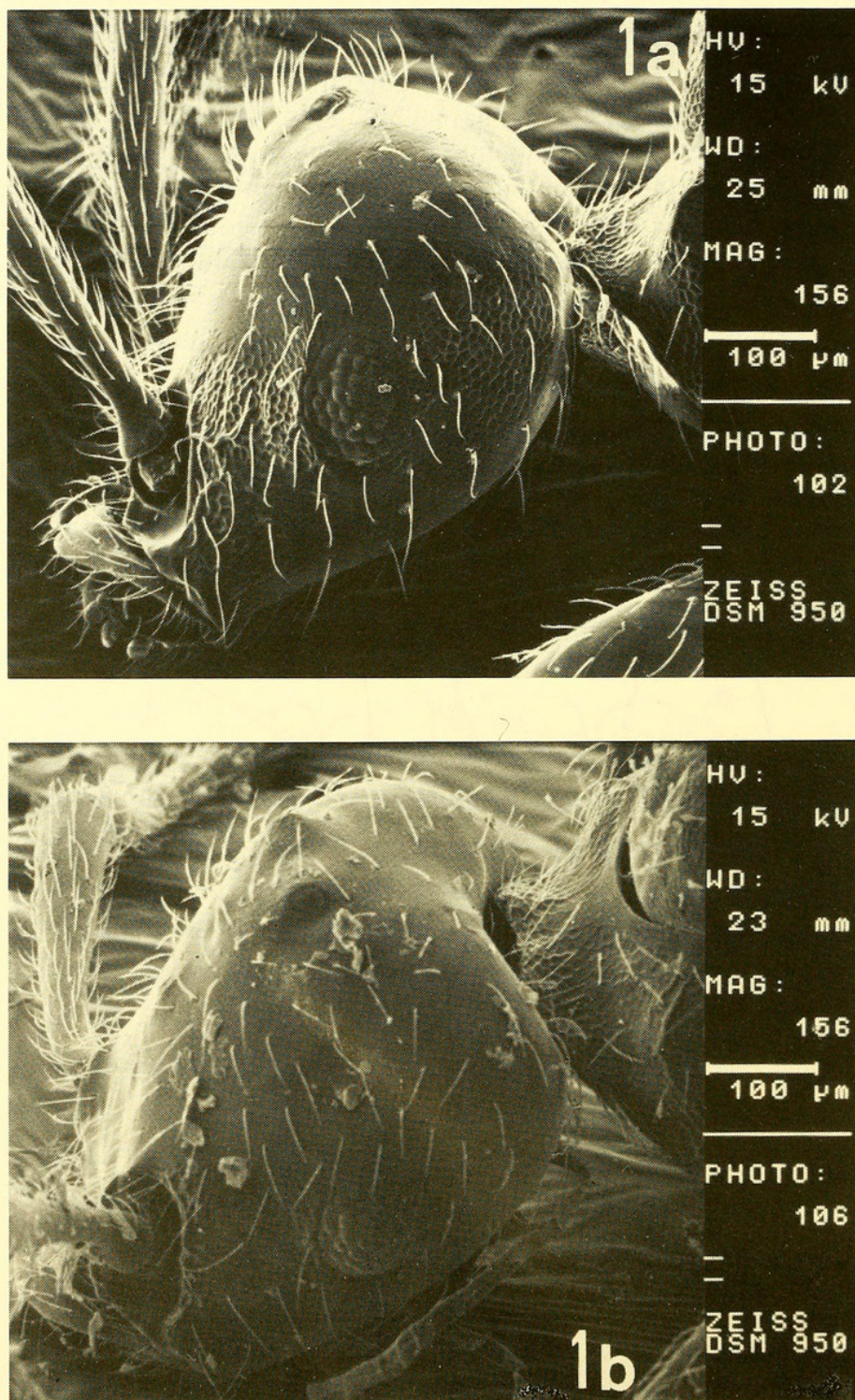


Photo 1. Lateral view of the head of *T. schneideri* from the Pyrenees (a) and of *T. kutteri* (b).

Height of petiole longer than its length. Petiolar scale triangular in profile, although the rear side flatter than front side. Surface microalveolate with small-sized hairs (Phot. 2 b). Postpetiole profile almost flat; in dorsal view semi-circular. Its surface smooth and shiny, with some small hairs near its articulation with the petiole.

Gaster typically dorso-ventrally flattened when the female is not fecundated. Surface completely smooth and shiny without hairs.

Variability. In the forty-two females observed, we did not find any noticeable morphological variation; however, in thirty-eight of them we found that the number of articles in the funiculum may change. In thirty-four females, there were nine articles on both antennae; one individual only had nine articles on one and ten on the other antennae; and three individuals had ten on both. Occasionally, it is not easy to decide the number of articles, because in the second article the outline of a suture may appear, making it difficult to verify whether there exists an articulation at that level or not. On one occasion, we found a possible fusion between the articles four and five. This variation in the number of antennal articles has also been observed by Buschinger (1985) in the genus *Epimyrma* Emery, 1915 and it has been always observed in *E. corsica* (Emery, 1895), a parasitic species having no workers. This might lead us to think that it is just another morphological simplification that appears in highly specialized parasitic species.

Description of male

General colour light brownish yellow. Only some sutures are a little darker in colour. Lacks hairs. The micro-reticulate tegument together with its scarce quitinization makes it dull and weak for the most part. Hyaline wings with slightly marked veins. Cubital cells hardly perceptible.

Head square-rectangular. Occipital margin convex as well as the lateral margins, although not very pronounced. Anterior clypeal margin straight. Mandibles very small, vestigial subtriangular. Eyes small, black, contrasting with the lighter colour of the head. Ocelli normal (Fig. 2 c). Scape long similar to that of the female reaching the occipital margin. Funiculum also like in female, with nine articles, the second twice as long the third, and it has an antennal club formed by three articles. Hairs very small and adpressed, scattered throughout the whole antennal surface.

Thorax rectangular, similar than that of female, but differing in that it lacks hairs and in being more rectangular (Fig. 1 b). Scutellum and metanotum elevated above the central dorsal surface of the thorax. Epinotum almost at a right angle between the dorsal face and the sloping one, without any spine.

Petiole height larger than its length. Petiolar scale slightly elevated, anterior and posterior margins short, they form a right angle with the dorsal margin. Very developed ventral region. Microreticulate surface without hairs. Postpetio smooth and shiny. Low. Seem from dorsally, it does not appear to be independent of the first gastric segment, which is normal in Myrmicinae, but it forms almost a continuation of it.

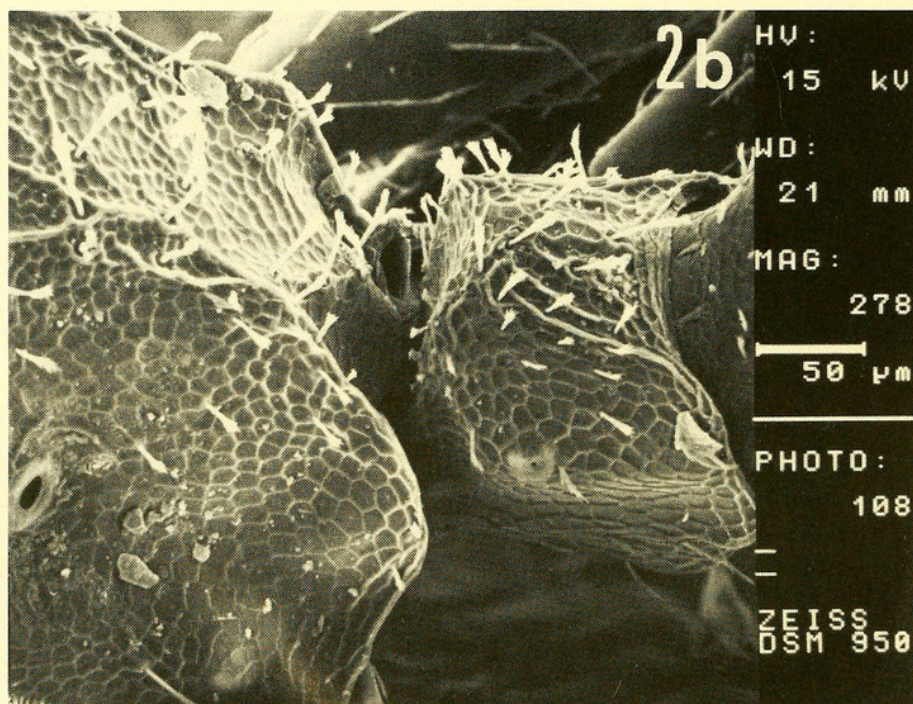
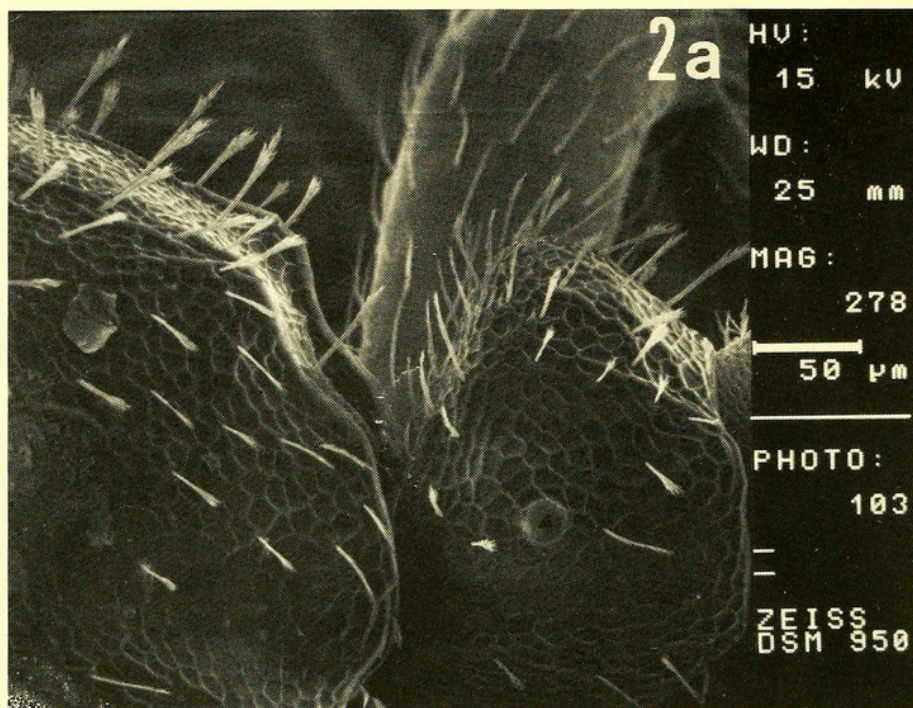
Subgenital plate wide, with anterior line uniformly arched and with many hairs along and near the border. Sagitta narrow, almost rectangular with a jagged border which has a sinusoidal shape. Lacinia not present and volsella with a rounded apex.

Variability. We did not find any variation among the three observed males. Two were dissected for their genital structure.

Discussion

Teleutomyrmex kutteri, spec. nov. is a species morphologically similar to *T. schneideri* Kutter, but we found a number of consistent differences which make it possible to identify and separate them.

First of all, the females of each species have different lengths of petiolar hairs: mean = 18.9μ ($n=10$)



in *T. kutteri* and $33.3\ \mu$ in *T. schneideri* (Phot. 2). This feature is easily noticed under a $40\times$ optical microscope and we have observed that it remains constant among the populations that we have studied. Other differences found between the females of both species, although not as noticeable as the former one, are 1.: profile of pronotum a bit more obtuse in *T. kutteri* and the spines less pronounced; 2.: head, seen from frontal, more rectangular in this species than in *T. schneideri* (Figs 1, 2); 3.: genae of *T. schneideri* more reticulate than those of *T. kutteri* (Phot. 1).

In the males, we studied the genital structure of two individuals of *T. schneideri* (one from Saas-Fee and the other from the Pyrenees) and two individuals of *T. kutteri*. We found that the principal differences appear in the genital structure, mainly in the subgenital plate which is slightly concave in *T. schneideri*, and in the sagita whose border has a sinusoidal shape in *T. kutteri*. The mandibles also

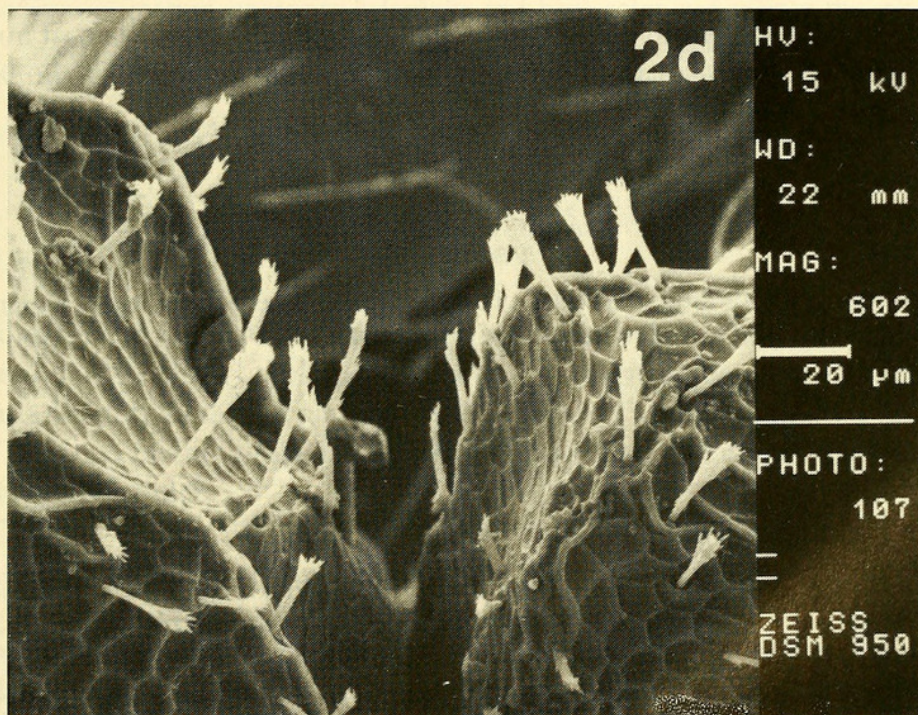
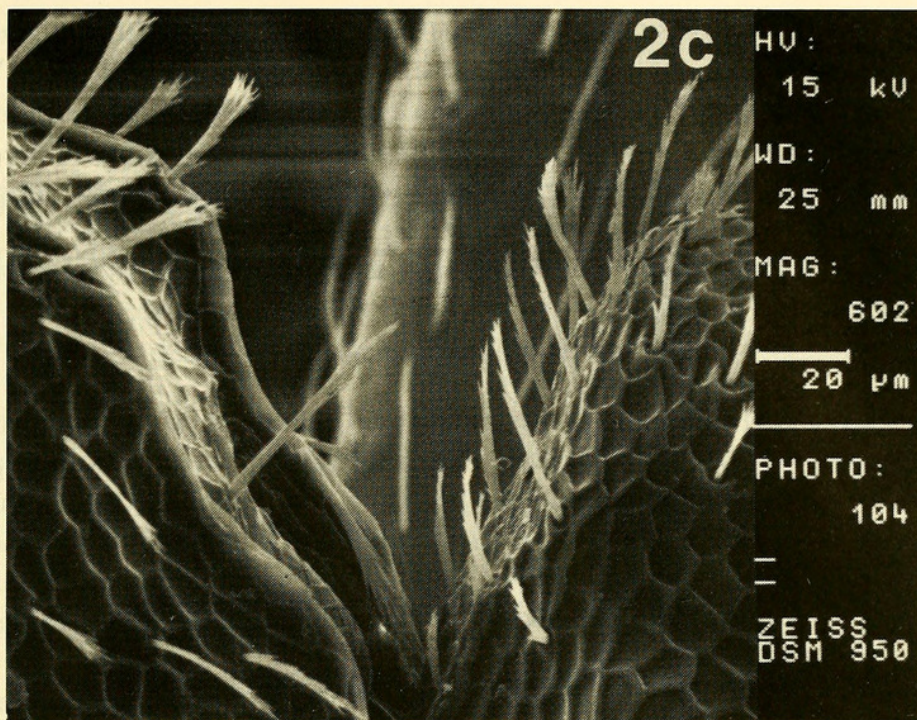


Photo 2. Epinotum and petiole of *T. schneideri* from the Pyrenees (a, c) and *T. kutteri* (b, d).

differ in both species and in *T. kutteri* the profile of the petiole has the dorsal margin more rectangular (Figs 1, 2).

The fact that the populations from the Alps and the Pyrenees seem almost identical and that both show the same differences to those from the Sierra Nevada, and also that the distance, geographically and chronologically, between the Sierra Nevada and the Alps and the Pyrenees is greater than that of the Alps and the Pyrenees, reinforces the idea that the genetical isolation maintained during 15.000 years at least (a period which is thought that happened the climate isolation of Sierra Nevada from the Alps and the Pyrenees) allowed the development of a new species.

These differences might seem insignificant but we consider that we are facing a genus which is very adaptable to parasitism and this involves a progressive morphological simplification. We see that there has been a loss of the tarsal comb, its stinger and consider even the fusion of some antennal segments as a result of the mentioned simplification. The phenomenon of parasitism gave rise, in other groups of arthropods, to forms as simple as the Lernaidae among crustaceans, the Mictetibidae among Diptera or the pupoid females of Strepsiptera. In all these cases, simplification is very important and it reduces the possibility of modification of external morphological features of each species when compared to free-living species. We suggest that *Teleutomyrmex* is such a case.

Biotope

This species has been found in a mountain brushwood, which is mainly comprised of *Juniperus communis* and *Genista baetica*, included in the Oro-mediterranean level. In this biotope, the following species of free-living Formicidae with bracketed percentages of abundance are found: *Tetramorium caespitum* (Linnaeus, 1758) (11.54), *Leptothorax tuberum* (Fabricius, 1775) (1.75), *Tapinoma nigerrium* f (Nylander, 1886) (62.24), *Proformica longiseta* Collingwood, 1978 (23.08), and *Lasius flavus* (Fabricius, 1781) (1.39). Among parasitic species, we found: *Strongylognatus testaceus* (Schenk, 1852) and *S. prope caeciliae* Forel, 1897.

As host species we found only *T. caespitum* (Linnaeus, 1758), even though Buschinger (1985, 1987) refers to *T. impurum* (Foerster, 1850) as the host in the nests found by him at Briançon and in the Pyrenees, respectively.

According to Lopez (1988), identification and status of *T. impurum* in Spain is not clear, not even when studying the males; in our case, all males found in the area in which *Teleutomyrmex* was discovered correspond to *T. caespitum*.

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